



Accident Report

San Rochelle

Fire & Sinking, 95.1 miles
Northwest of Cape Reinga
on 27 October 2004

Class A





San Rochelle



REPORT NO.: 04 3590

VESSEL NAME: *SAN ROCHELLE*

Ship Type:	Commercial Fishing Vessel
Certified Operating Limit:	Offshore
Port of Registry:	Auckland
Flag:	New Zealand
MSA No.:	101316
Built:	1971
Construction Material:	Steel
Length Overall (m):	16.42
Maximum Breadth:	4.65
Gross Tonnage:	37.45
Net Tonnage:	12.44
Registered Owner:	Challenger Trawler Company Co Ltd
SSM Company:	Nortel (1998) Ltd
Accident Investigator:	Ian Howden



SUMMARY

San Rochelle was a tuna longline vessel that suffered an engine room fire 95.1 nautical miles northwest of Cape Reinga on 27 October 2004. The crew abandoned the vessel after the Skipper attempted unsuccessfully to control the fire. They were subsequently rescued by helicopter. At the time of writing this report it is assumed the vessel sank, as salvage vessels that arrived at her last known position did not sight her. The Skipper and crew were unable to state the cause of fire or where in the engine room it began.

Without a vessel to examine and insufficient evidence from the crew, the Investigator was unable to determine the cause of fire and the subsequent foundering of the vessel.

This report examines current requirements under the Maritime Rules for offshore vessels and makes recommendations to improve fire-fighting requirements for fishing vessels operating in offshore waters.



NARRATIVE

San Rochelle was a steel New Zealand fishing vessel operating under Safe Ship Management (SSM). She was built in 1971. Her home port was Auckland. She had a registered length of 15.3 metres and a breadth of 4.65 metres. A Detroit diesel 871 main engine developing 171kW powered the vessel. **San Rochelle** had a cruising speed of 8 knots and a maximum speed of 10 knots. She had an Onan 4.5KVA generator. *NB. Vessel specifications are based on figures obtained from historical survey documentation obtained from the vessel's Safe Ship Management companies.*

Challenger Trawler Company Co. Ltd of Auckland owned **San Rochelle**. The Skipper was the sole owner of the company. The vessel's SSM company was Nortel (1998) Ltd.

San Rochelle held a SSM Certificate issued by Nortel on 21 July 2004 and valid to 29 July 2005. The Certificate specified the vessel could not proceed beyond "offshore limits up to 200 mile limits". The vessel was last audited on 18 August 2003 by Nortel. No deficiencies were raised at this or her previous out of water inspection on 29 July 2002. The last flag state inspection by the Maritime Safety Authority (as it then was) was carried out on 10 July 2001. No deficiencies were noted on that date.

The Skipper of **San Rochelle** is an experienced commercial fisherman with 30 years experience in the industry. He had worked on the vessel since 1998 before purchasing her. He held a Certificate of Competency as Skipper of a Deep-Sea Fishing Boat, issued in 1988. He held a Second Class Diesel Trawler Engineer Certificate issued in 1982. He had completed a Ship Fire-Fighting course in 1989. Approximately five years previously he was Mate of the fishing vessel **San Vestman** when there was a fire after a hydraulic PTO (Power Take Off) hose ruptured causing oil to spray on to the main engine exhaust and ignite. Approximately one year before that he was Skipper of the fishing vessel **Dorado** that suffered a fire at the turbo charger after a fuel injector line failure. On both occasions the ship's crew brought the fires under control.

The senior crewman was an experienced deckhand. He had crewed on **San Rochelle** for 11 months. He held an Advanced Fishing Deckhand Certificate of endorsement, issued in 2002.

The second crewman was a UK national who had not previously worked on a commercial fishing vessel. It was his first trip on **San Rochelle**. He held no maritime qualifications.



THE ACCIDENT

(Note all times given are New Zealand Daylight Time)

At approximately 1230 hours on 24 October 2004, **San Rochelle** departed Auckland. The vessel stopped at Kawau Island to repair a stabilizer arm and proceeded directly towards her intended fishing grounds north of Cape Reinga. On board were the Skipper and two crew. The voyage north was uneventful. At approximately 1600 hours on 26 October, **San Rochelle** arrived at her fishing grounds. The main engine was turned off. Fishing gear was prepared and the crew relaxed. (See Figure 1 - NZ Chart 23 showing approximate track of vessel to fishing grounds and Mayday position).

At 0115 hours on 27 October, at position 33° 10 S 172° 02 E, the crew commenced setting the fishing gear over the stern. The vessel was traveling at approximately six knots. She was on automatic pilot on a northerly heading. The crew was positioned at the stern clipping on snoods. The Skipper was putting floats on the long line whilst monitoring the vessel's speed and keeping a lookout for other vessels. He was carrying out regular engine room checks and had last checked the engine room about 30 to 45 minutes, prior to discovering the fire.

At approximately 0345 hours, the crew observed light grey smoke coming from a position aft of the wheelhouse. The Skipper immediately entered the wheelhouse, reduced speed and took the engine out of gear. He opened the engine room hatch in the saloon and observed flames and a moderate amount of grey/black smoke coming from the port side of the engine room, at deckhead level. There was no machinery immediately below the hatch. He shouted to his crew that the vessel was on fire. The Skipper discharged a 9 kg CO₂ fire extinguisher through the engine room hatch but this had no apparent effect on the fire. He then closed the hatch and ordered the senior deckhand to get the vessel's liferaft that was located on top of the wheelhouse on to the aft deck. He also ordered that the tender, located aft on the roof of the fantail, be launched. The Skipper then tied down the trigger of a 9 kg foam extinguisher and threw this down the engine room hatch, immediately closing the hatch afterwards. Shortly after this, the main engine stopped. The Skipper went to the deckhead and closed the vents and dogs for the engine room air intake and exhaust. He then went to the aft hatch and shut off the fuel tanks. He returned to the wheelhouse and re-opened the engine room hatch. He observed the flames had not reduced in intensity and immediately closed the hatch again.

At approximately 0350 hours, as the crew grabbed emergency equipment, food and other survival gear. The Skipper made three May Day calls on **San Rochelle's** single sideband (SSB) radio on 2182 MHz. The reply from Maritime Operations Centre (MOC) in Wellington was not received by the vessel's SSB. With no audible reply on 2182 MHz, the Skipper repeated the call twice on 4125 MHz. At 0357 hours, MOC raised the vessel and were advised she was on fire with three persons on board in position 32° 56' S 172° 02' E.

As the crew positioned the liferaft on the starboard quarter for launching and launched the tender over the stern, the Skipper checked the aft engine room bulkhead for heat from within the forward fish hold and also the saloon to determine if the fire was under control. He determined the heat from the fire was increasing.

At 0430 hours, the Skipper activated the 406 Emergency Position Indicator Radio Beacon (EPIRB) and ordered the crew with the beacon into the liferaft that had been tethered to **San Rochelle**. The crew then activated an additional 121.5/243 EPIRB from the liferaft. The Skipper spent approximately 20 to 30 minutes checking the vessel to further determine the extent of the fire. On several occasions he entered the aft fish hold to check the bulkhead to determine whether the fire was intensifying or diminishing. He then attempted to access the SSB in the wheelhouse but was unable to do so due to the smoke, strong fumes and flames coming from the switchboard on the starboard side of the saloon. At 0500 hours, due to the intensity of the fire and toxic fumes the Skipper abandoned **San Rochelle**. He rowed the tender with the liferaft in tow clear of the vessel. During the following five hours the crew observed the vessel burning. The steel wheelhouse was glowing red from the heat, and flames were reaching approximately one to two metres above the wheelhouse. Windows were heard exploding. Due to darkness, the colour of the smoke could not be determined. After the Skipper got into the liferaft he fired a rocket. By this time the flames had decreased. At 0700 hours, the Skipper rowed back to the vessel but was unable to board due to the intensity of the fire and fumes. He returned to the liferaft until rescue arrived.



The crew did not take any personal belongings with them. A rifle was taken on board the raft for protection against sharks. The crew was dressed in the same clothing including wet weather gear that they were wearing prior to detecting the fire.

The evidence of a crewman was that after he boarded the liferaft the Skipper remained on board **San Rochelle** for no more than five minutes.

Rescue

At 0410 hours, MOC contacted Westpac helicopter rescue personnel in Auckland and advised them of the situation.

At 0614 hours, the Westpac Rescue Helicopter departed from Auckland for Whangarei and Te Pahi Station for additional refueling (Te Pahi Station is a Department of Conservation Station near Cape Reinga with a fuel dump that enables long range helicopter rescues to be carried out in northern waters)

At 0700 hours, a RNZAF Orion took off from Whenuapai airbase.

At approximately 0745 hours, the Orion sighted **San Rochelle** and the crew in the liferaft.

At 0906 hours, the Westpac helicopter departed Te Pahi Station for the **San Rochelle**.

At 0958 hours, the Westpac helicopter was on the scene and after 10 minutes had recovered the crew from the liferaft.

At 1103 hours, the crew were landed at Te Pahi Station

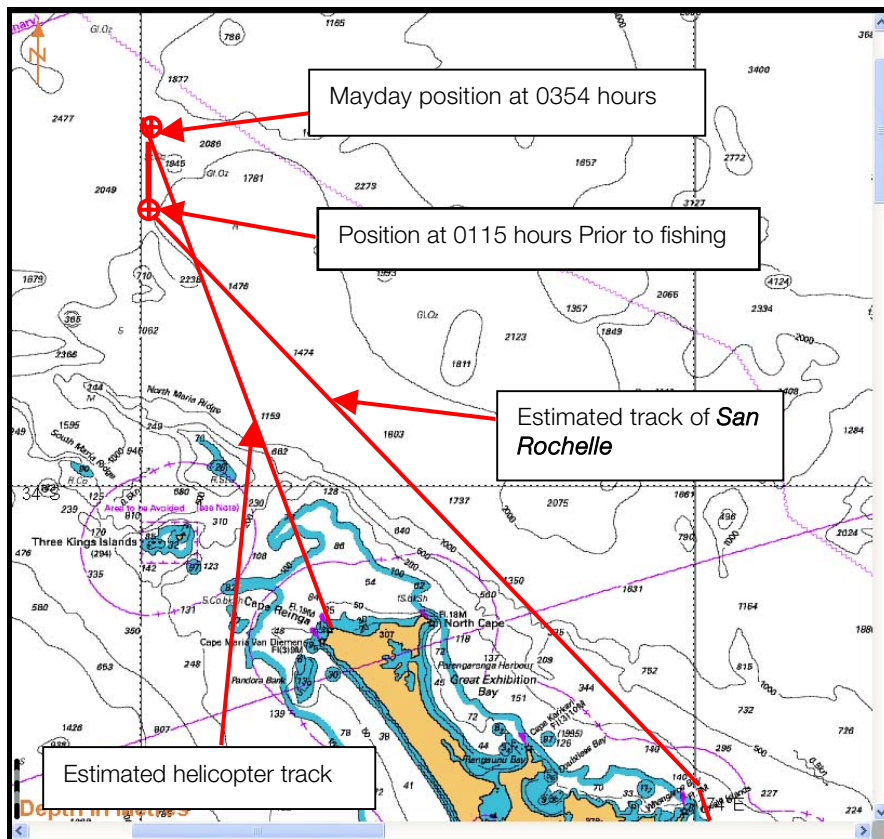


Figure 1 – Estimated Track of **San Rochelle** & Helicopter



Weather

The Westpac rescue helicopter logged weather conditions as calm during the rescue. Winds were from the south at 10 knots with a one metre southerly swell (See Figure 2 - National Meteorological and Oceanographic Centre Bureau of Meteorology Weather Situation Valid 0000 UTC 27 October (1300 hours NZDT 2004))

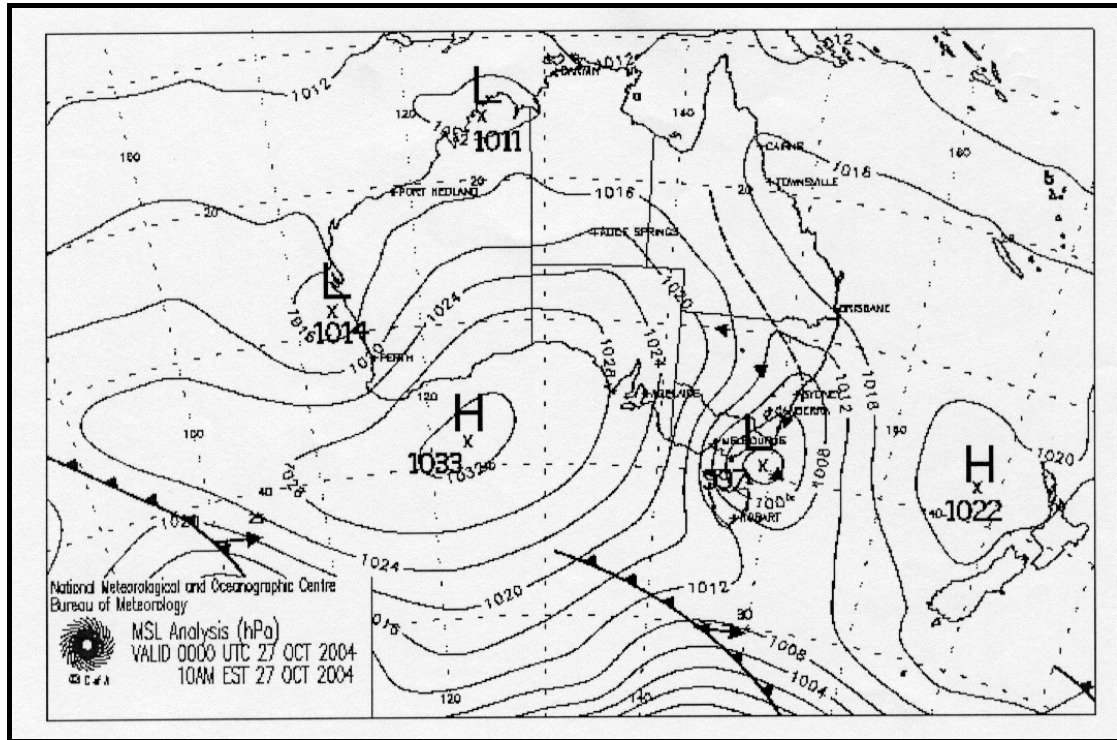


Figure 2 – Weather Situation

COMMENT & ANALYSIS

Maritime New Zealand commenced this investigation on 27 October 2004. The Skipper and senior crewman were interviewed at the Maritime New Zealand office in Auckland on 29 October. The other crewman was interviewed on 1 November. Documentation was obtained from **San Rochelle's** SSM Companies, the owner and the vessel's insurers. All on board documentation was lost when the vessel sank.

The Fire

The crew stated that when first observed, the smoke was light grey in colour and was in the vicinity of the exhaust stack abaft of the wheelhouse. The Skipper stated the flames were licking around the hatch coaming to the engine room from the port side of the deckhead when he first opened the hatch. He was unable to see the source of the fire or enter the engine room due to the smoke and heat. As a result he was unable to direct fire extinguishers at the source of the fire. For this reason he elected not to use the remaining fire extinguishers and instead opted to fight the fire by cutting off the oxygen supply in accordance with his fire fighting training. He was aware that opening the hatch a third time would allow oxygen to the fire but he stated he had to know the situation in the engine room to determine if it was necessary to abandon ship. The vessel had a deck pump on board that could have been used to fight the fire. However, it was operated off the main engine and when this failed the pump was rendered inoperable (See *Figure 3 – General Arrangement Diagram for Saloon & Deck*).



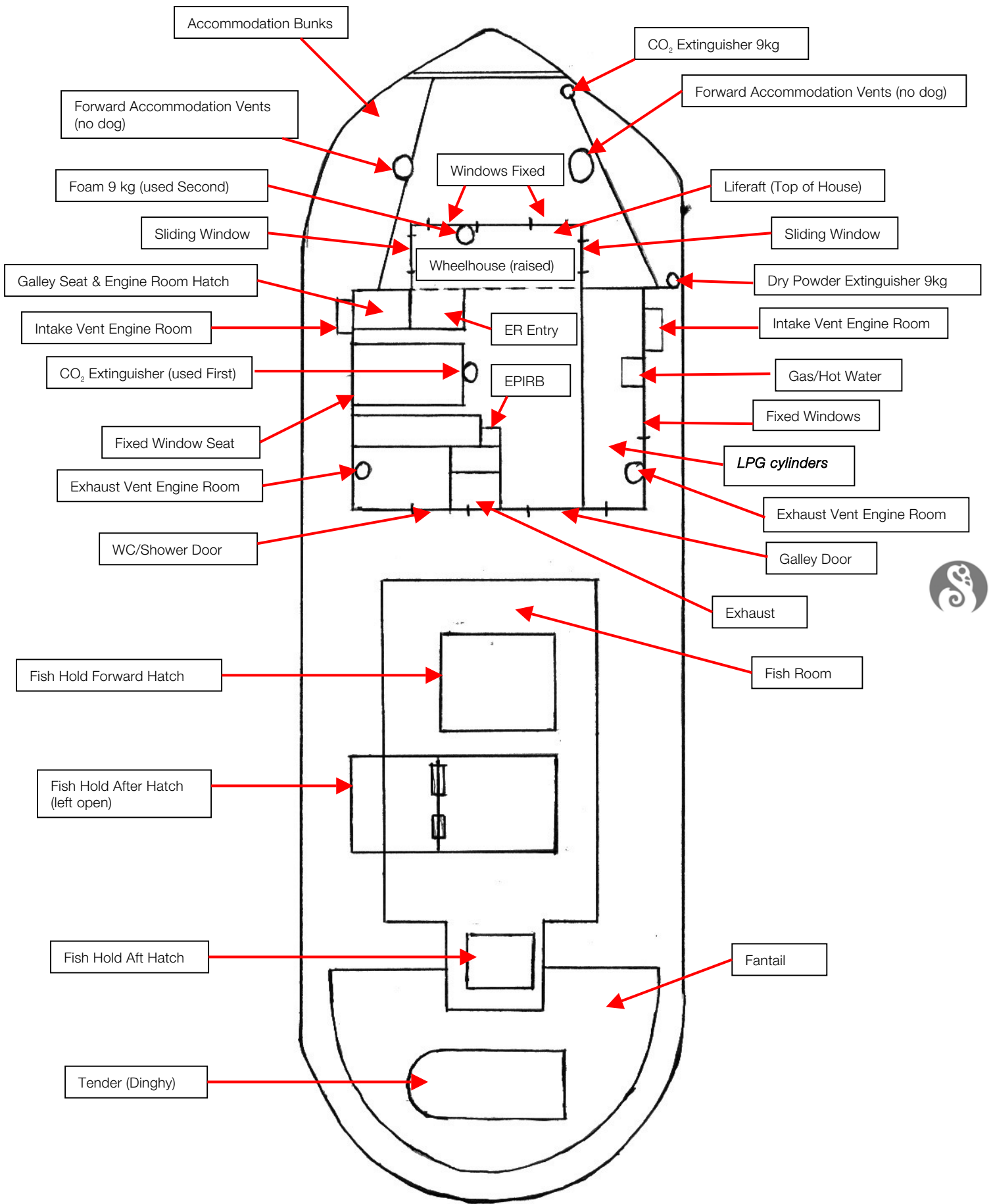


Figure 3 – *San Rochelle* Saloon/Deck General Arrangement Plan

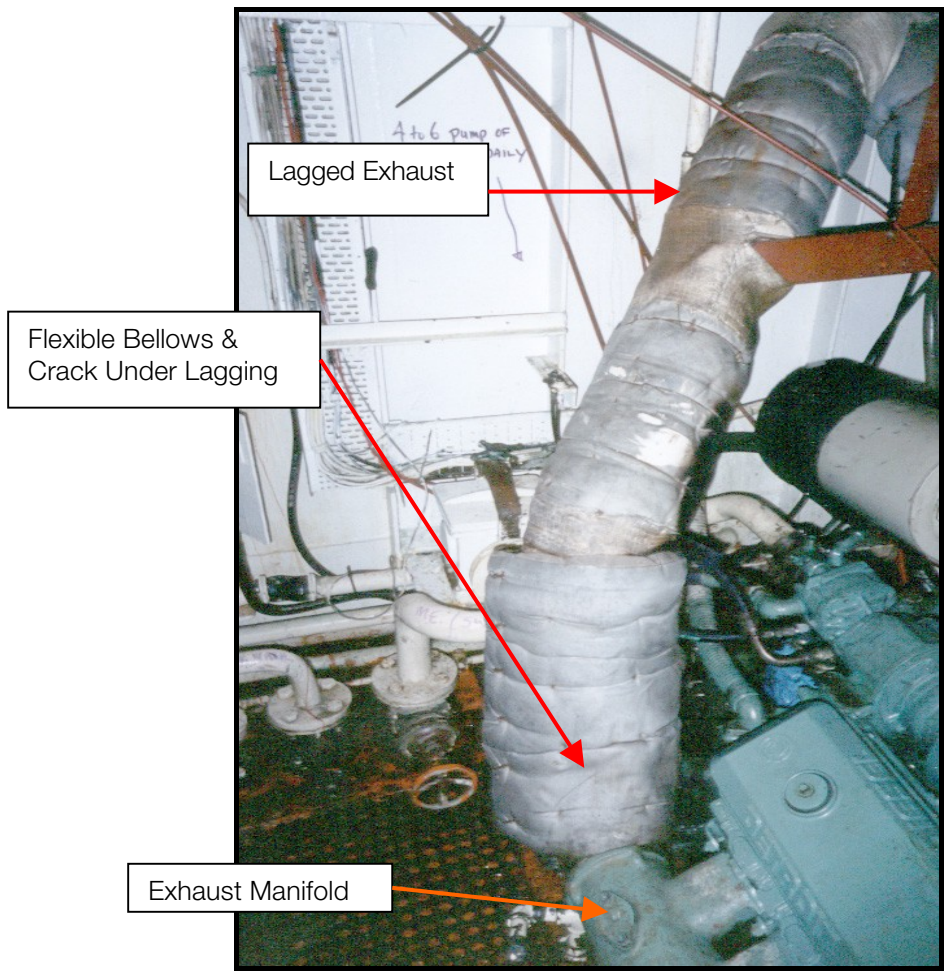


Figure 4 – Photograph of Engine Room Exhaust Vent & Engine Room Air Intake from Top of House

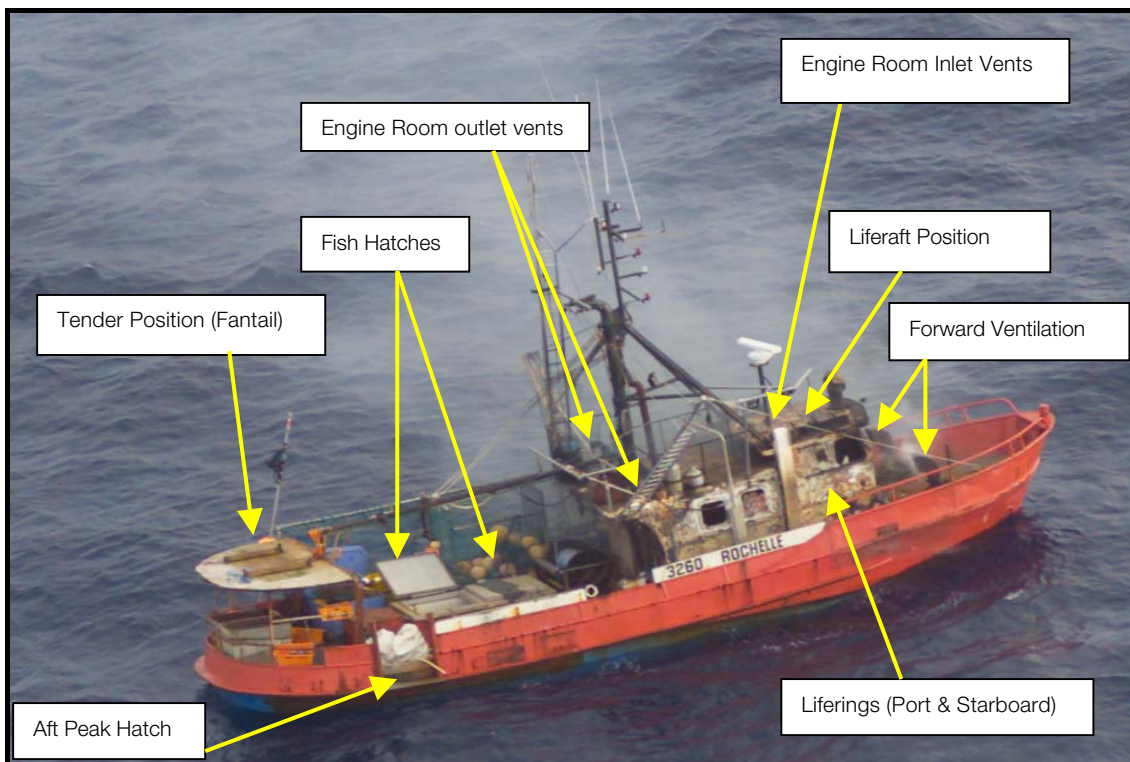


Figure 5 – Photograph of Vessel Detailing Location of Vents & Safety Equipment

Fire Fighting Equipment – Maritime Rules

Under the Maritime Rules there was no requirement for *San Rochelle* to have either a fire detection system or a fixed fire fighting system in the engine room. Under Rule 40D of the Maritime Rules Appendix 2 Table 2.3, this is only a requirement for vessels of 24 metres in length and over. Under the Table she was also not required to have a fire pump that operated independently of the main engine.

San Rochelle had the following firefighting equipment on board:

The capacity of the fire extinguishers is based on the Skipper's recollections. Documentation obtained from the vessel's current SSM Company did not provide details.

- 1 x 9 litre Foam extinguisher located in the forward wheelhouse
- 1 x 9 kg Dry powder extinguisher located in the forward Accommodation.
- 1 x 9 kg CO₂ extinguisher located in the forward accommodation.
- 1 x 9 kg CO₂ extinguisher located in the saloon.
- Buckets (2) located forward in the accommodation area
- Axe located forward in the accommodation area.
- Fire hose located on the aft deck.

A Davis two-inch fire pump was driven by the main engine. The pump was inspected in July 2004 by the vessel's SSM company. The fire hose pressure was tested with the nozzle attached and unattached and found to produce a more than adequate flow. The Skipper could not recall the pump's exact capacity but stated it was able to emit a flow the complete length of the vessel without the nozzle attached.

Safe Ship Management (SSM) Certification

San Rochelle held a current SSM Certificate, issued by the vessel's SSM Company Nortel (1988) Ltd on 21 July 2004, valid until 29 July 2005. This specified the vessel could not proceed beyond "Offshore limits up to 200 mile limits" (See Appendix 1 - SSM Certificate). Previously she held a coastal limits survey issued on 29 July 2004, limiting her to 100 miles offshore.



Manning

San Rochelle complied with manning requirements for a vessel of less than 20 metres operating within 100 miles of shore. Her manning did not comply with her operational limits of 200 miles offshore.

Health & Safety in Employment Act Requirements

The Skipper stated *San Rochelle's* SSM manual had firefighting procedures and that monthly maintenance checks were up to date and that the vessel had a hazard register and crew training records. The senior crewman had been trained in fire fighting procedures and other drills at the Nelson Marlborough Institute of Technology in September 2002, when he completed course requirements for his Advanced Fishing Deckhand Certificate. The senior crewman instructed the new crewman on hazards on board the vessel before departure. This included location of safety and fire fighting equipment. The Skipper stated he had a robust hazard identification system on board and conducted drills, including a fire drill, every 14 days. He checked with the senior crewman that the new crewman had been properly instructed and was satisfied this had been done correctly. Documentary confirmation that Health and Safety and SSM requirements had been met was not possible as all on board documentation was lost. The vessel's SSM company was not able to produce records of training or Hazard identification, although a SSM company safety profile inspection, dated 18 August 2004, rated identification and management of Hazards as "Regularly scheduled".

Life Saving Appliances

San Rochelle's SSM Certificate specified that she was required to carry life saving appliances for four persons. The following appliances were on board:

- 5 x Lifejackets located in the forward accommodation (the Skipper was uncertain what class of jackets these were. Historical documentation identified four SOLAS approved lifejackets on board.
- 2 x Life rings located externally on both sides of the house.
- 1 x Four man Pacific 4 non-SOLAS liferaft with a B pack located on the top of the wheelhouse. This was last serviced on 9 July 2004.
- 1 x 2 metre pram dinghy (tender).

Communication/Emergency Communication Equipment

- 1 x SSB radio located in the wheelhouse.
- 1 x VHF (very high frequency) radio located in the wheelhouse.
- 6 x Parachute rockets located in the forward accommodation.
- 2 x Smoke flares located in the forward accommodation.
- 1 x EPIRB 406 MHz located in the saloon.
- 1 x EPIRB 121.5 /243 MHz packed in the liferaft.

Combustible Materials in the Engine Room

- Three 20-litre drums of main engine oil.
- One 20-litre auxiliary oil drum.
- One ½ 20 litre drum of auxiliary oil.
- One 20-litre drum of hydraulic engine oil.
- There were two hydraulic oil tanks located on the port and starboard forward bulkhead. They contained 150 and 180 litres respectively.
- One 20-litre fuel service trap.
- The forward bulkhead had foam insulation material.
- Two pressed up 3,000 litre main engine fuel tanks under the port and starboard engine room floor plates.
- Four main engine start batteries.
- Two auxiliary engine start batteries.
- CRC and grease canisters.

A ten-kilo drum of chlorine was also stored in the forward section of the engine room.

The main fuel tanks were located in the aft section of the vessel up against the aft bulkhead. These were capable of holding 4,000 litres each and held approximately 3 600 litres of Marine Diesel Oil (MDO) each at the time of sinking.

Hydraulic steering lines that ran from the back of the main engine contained 57 litres of oil.

Chlorine and turpentine were stored under a starboard bunk in the forward accommodation area.

San Rochelle had four bulkheads and five separate compartments.

The vessel had 3 fish holds. The fish room contained 10 tonnes of ice, five tonnes of refrigerated salt water and 1.5 tonnes of bait.



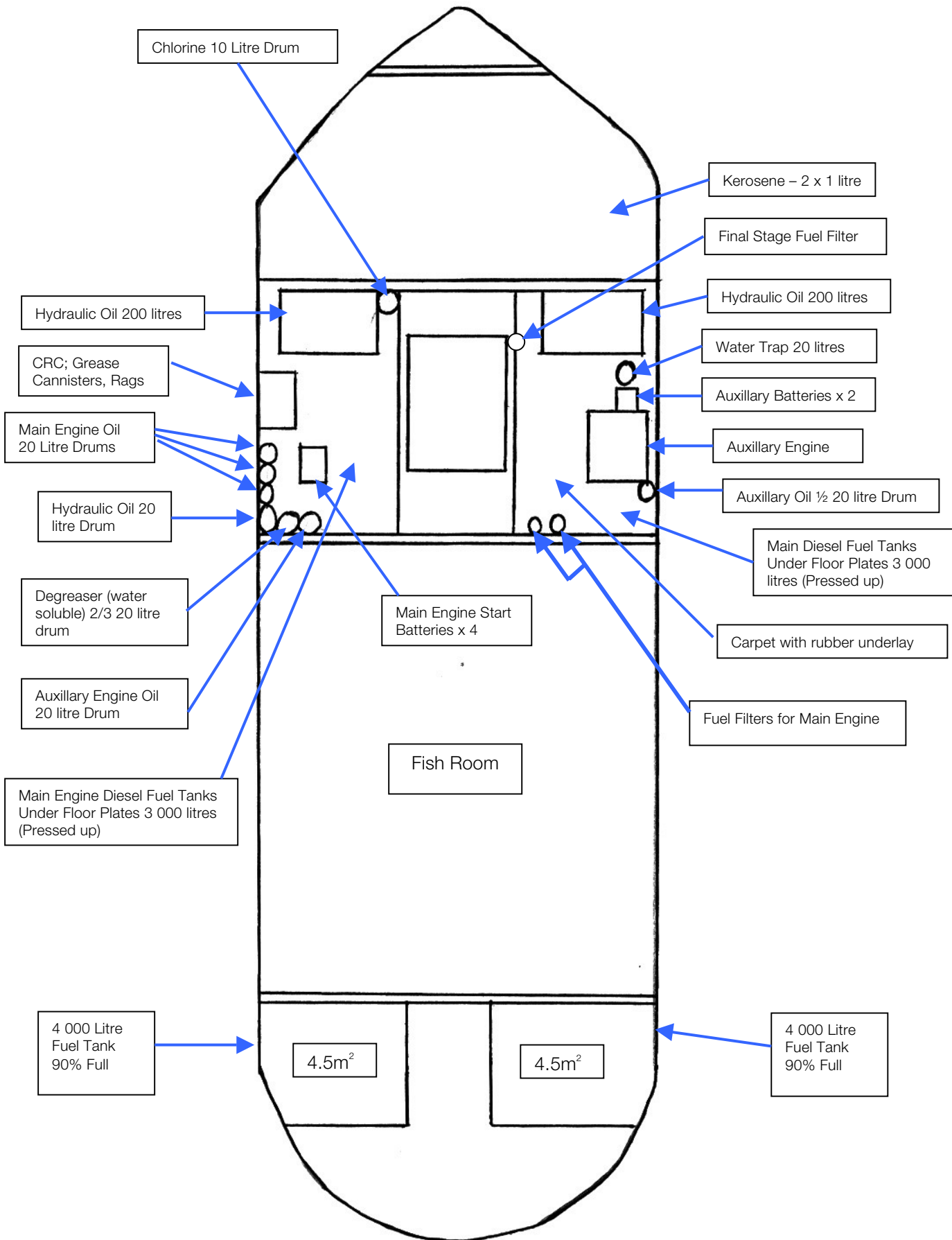


Figure 6 – *San Rochelle* Engine Room General Arrangement Plan

San Rochelle had suffered a minor fire under the previous owner. On that occasion, brackets holding the main engine exhaust at the deckhead of the engine room had broken causing contact at the deck head. Creosote had then ignited.

The Master stated that *San Rochelle* had a rebuilt main engine installed approximately 18 months prior to the accident. Prior to departure on 24 October, he was aware of a crack in the section of bellows between the manifold and main engine exhaust system. This was an ongoing problem due to misalignment of the exhaust pipe with a resultant small amount of exhaust gasses leaking into the engine room. He had made arrangements for repairs on return.

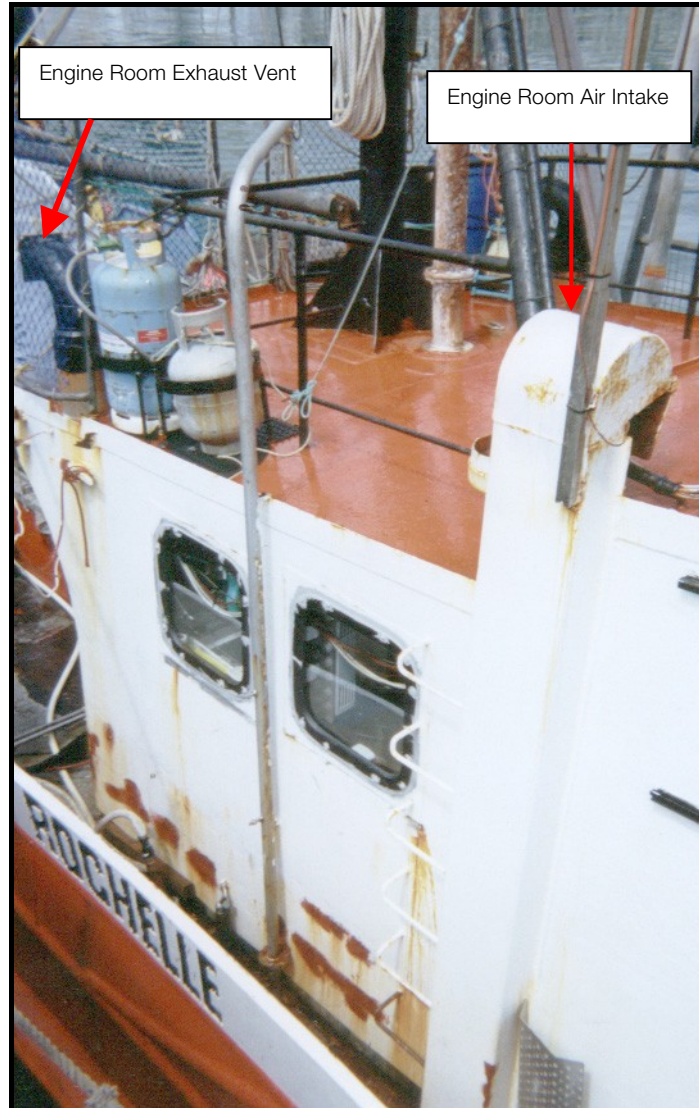


Figure 7 – Photograph of Exhaust Vent and Air Intake

San Rochelle's Safe Ship Management (SSM) documentation was lost with the vessel. The SSM Company did not have a complete duplicate of the documentation as required by best practice.

All skin fittings on *San Rochelle* were metallic. Solid steel watertight bulkheads separated the engine room from the rest of the vessel. The 871 Detroit diesel engine had internal fuel injectors. The only access to the engine room was through the hatch located in the saloon.

The last photographs of *San Rochelle* were taken approximately five hours after the height of the fire. They show substantial fire damage to the wheelhouse with smoke emitting from the forward vents. There is no visible damage from the fish hold aft. This suggests the aft engine room bulkhead may have prevented the fire from spreading. In addition there was no obvious list or trim indicating the vessel had taken little or no water at that time. From the photograph in Figure 8, it would appear the fire had largely burnt out at the time it was taken. Smoke can clearly be seen coming from the wheelhouse and forward



sections of the vessel. The companionway door was constructed of wood and had burned through when photographed. What appear to be flames are visible through the companionway entrance. The photograph below shows the vessel still riding high in the water (See Figure 8 - Photograph of Vessel).



Figure 8 – RNZAF Photograph of Vessel



The first vessel to arrive at **San Rochelle's** last known position at 1430 hours found no trace of the vessel except the longline equipment that had been set prior to the fire.

A commissioned report by a fire consultant considered different scenarios that may have caused the fire. After analyzing the evidence the report came to the conclusion that the evidence of the crew when compared with the associated evidence was credible (See Appendix 2 – Ruawhetu Engineering Limited Report).

Intense heat in the engine room would have distorted metal and possibly broken welds. There were two pressed up 3 000 litre fuel tanks in the engine room. The rupturing and possible explosion of these tanks is a possibility. Diesel has a flash point of approximately 65° Centigrade.

The burning of pipe joints could have affected the structural integrity with resultant ingress of water.

Whilst the photographs do not show fire damage aft of the wheelhouse this possibility cannot be discounted. It is possible fire could have spread along the tail shaft given the flammable lubrication material in the shaft.

The photographs taken by the RNZAF Orion establish that the aft fish hatch cover was left open and that the saloon entrance door had burnt away. Once the door burned through this would have fed oxygen to the fire. Equally, once the saloon windows exploded from the heat this too would have fed oxygen to the fire.

Given the calm conditions it is likely that the water initially entered **San Rochelle** from below the water line making the vessel sit low in the water. Provided the saloon and accommodation area were not flooded beforehand by ingress below the waterline, the open companionway entrance would have contributed to the vessel's loss, once the deck edge had become immersed, thereby allowing water to downflood into these areas. It is possible that if the flooding had been restricted to the engine room, the vessel would have had sufficient reserve buoyancy to remain afloat.

The sinking coincided with near perfect weather conditions. This facilitated what was referred to by SAR authorities as a “text book’ rescue enabling a rapid recovery of the crew.

Analysis of the 283 United Kingdom registered fishing vessel losses that were reported to the Marine Accident Investigation Branch (MAIB) in Southampton, in the years 1992 to 2000, show that 153 were due to foundering/floodings; 43 were listing and capsizes and 20 were fires. The balance was due to collisions and strandings/groundings.

The MAIB found that contrary to popular expectation, there was no connection between flooding incidents and bad weather and that weather and sea conditions appeared to have little or no impact on the source of flooding.

The MAIB report, dated July 2002, showed that flooding accidents occurred predominantly because salt water pipework had failed or the hull integrity had been breached. Downflooding was found to be common, but to a lesser extent and often occurred because weathertight hatches, scuttles or doors had been left open.

Throwing fire extinguishers in to burning engine rooms is not recommended. The likelihood of a foam extinguisher operating effectively in such scenarios is remote as foam should be directed at the base of a fire before it can be effective. Pressure in foam extinguishers is caused by nitrogen exerting downwards pressure on the siphon at the bottom of the cylinder. If a cylinder ends up in a horizontal position as is likely if thrown on an engine room floor it will loose pressure once the bottom of the siphon is exposed (i.e. When 50% of the contents are extinguished). If inverted it becomes virtually useless. An important factor to consider in this situation is that if the trigger tie comes loose the extinguisher remains pressurized with the potential to explode endangering those on board. Foam extinguishers are pressurized at 195 PSI. Unlike CO₂ cylinders that are pressurized at 832 PSI, foam extinguishers do not have burst disks that enable product to release when pressure is created by excessive heat. Another characteristic of foam extinguishers is that because they are relatively low pressure they have comparatively thin walls and are more susceptible to rupturing.



CONCLUSIONS

N.B. These are not listed in order of importance

- It was not possible to determine the cause of the fire and the subsequent foundering of the vessel due to the inability of the crew to enter the engine room and the vessel's subsequent loss in deep water.
- Nor is it possible to determine how, despite having the appearance of riding high in the water at 1000 hours, **San Rochelle** apparently flooded and sank before the first salvage vessel arrived at her last known position approximately four and a half hours later. During this period there was no significant change in the relatively calm sea conditions that prevailed.
- The manning on **San Rochelle** complied for a vessel with 100 mile operational limits. It did not comply for a vessel operating in offshore limits up to 200 miles.
- Despite holding an offshore SSM Certificate **San Rochelle** was not required under the Maritime Rules to have a fixed fire fighting system in the engine room or a fire pump that operated independently of the main engine.



SAFETY RECOMMENDATIONS

1. It is recommended that the Rule and International Standards Division of Maritime New Zealand give active consideration to an amendment to **Maritime Rule Part 40D – Design, Construction and Equipment – Fishing Ships**, that will require all fishing vessels of less than 24 metres in length and which proceed beyond coastal limits in New Zealand to be fitted with either a fixed fire detection system acceptable to the SSM Surveyor or have a power driven emergency fire pump placed/installed remote from machinery spaces and capable of being driven independent of the vessel's main and auxiliary machinery.
2. The failure to ensure the aft fish hold hatch on the weather deck had been closed properly before abandoning the vessel could have been avoided by the application of good seamanship and a general awareness of the risks such an opening provided. In this regard, it is recommended that copies of this report be forwarded to Fish SAFE for their attention and that a copy of the report be forwarded to Seafood NZ and Professional Skipper magazines.

