

Accident Report

Foundering & Loss of life

Mi Jay

November 2005

Report Issued on 4 June 2008





Photograph 1
Mi Jay

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REPORT NO.: 05 3913

VESSEL NAME: *MI JAY*

Ship Type:	Fishing Vessel
Certified Operating Limit:	Offshore limit within 100 miles of the coast including Stewart Island and Chatham Islands and within coverage of VHF Coast Station Channel 16
Port of Registry:	Nelson
Flag:	New Zealand
Maritime NZ No.:	101179
Built:	1962
Construction Material:	Steel
Length Overall (m):	13.05
Breadth (m):	3.51
Gross Tonnage:	22
Net Tonnage:	5.59
Registered Owner:	Crusader Fisheries Limited
Ship Operator/Manager:	Warwick Loader
SSM Company:	SGS-M&I
Accident Investigator:	Domonic Venz

SUMMARY

On 22 November 2005, the fishing vessel ***Mi Jay*** departed Nelson bound for the east coast of the South Island to long line fish for grouper and blue nose.

The vessel left with a Skipper and two crew on board. The vessel had been provisioned with stores, ice, fuel and fresh water for approximately 14 days. The Owner and Skipper expected the vessel to unload in Nelson within about 7 days, all things going as expected.

Fourteen days after ***Mi Jay*** left Nelson, the vessel's Owner contacted the Rescue Coordination Centre of New Zealand (RCCNZ) to report the vessel overdue.

Over the next two weeks RCCNZ conducted extensive searches around the Mernoo Bank area and Chatham Island area as well as helicopter shoreline searches along the Wairarapa Coast and the Marlborough to North Canterbury coast (*See Figures 2 & 3*). On 17 December 2005, the search was officially called off.

On 19 December 2005 the life raft belonging to ***Mi Jay*** was found approximately 15 nautical miles (NM) south east of Kaikoura. It contained the bodies of the two crew.

Neither the body of the Skipper nor any wreckage of the vessel has been found.

This report concludes that the vessel could have stayed at sea for up to 14 days, without the need to replenish stores or fuel. The life raft was in the water for approximately 3 weeks. There was a lack of instruction and understanding by the Owner regarding fishing areas and communication arrangements with the vessel. The vessel was most likely overwhelmed by a catastrophic event. The vessel's Electronic Position Indicating Radio Beacon (EPIRB) did not activate.

It is recommended that this report be promulgated to the fishing industry and educational institutions to highlight the need for better radio communications between fishing vessels and a nominated person ashore. It is also recommended that Maritime NZ conducts an analysis to determine whether carriage of EPIRBs in life rafts for all fishing vessels operating outside 12 nautical miles from the New Zealand coast should be made mandatory. Other recommendations are made.

NARRATIVE

Vessel

Mi Jay was a steel Offshore fishing vessel restricted to ply within 100 nautical miles (NM) of the New Zealand coast. DJ Gilbert Limited of Whangarei built the vessel in 1962. She had operated predominately as a rock lobster and a blue cod trap vessel.

She was owned and operated by Crusader Fisheries Ltd of Nelson.

The vessel had a valid Safe Ship Management (SSM) Certificate when she departed Nelson on 22 November 2005. The SSM Certificate was due to expire on 30 November 2005.

She had an overall length of 13.05 metres (m), a registered length of 11.93m and a gross tonnage of 22 tonnes. Propulsive power was provided by a Gardner diesel engine model 6LX, developing 82 kW via a Gardner 2 VC gearbox and 2 inch propeller shaft, to a 32 inch fixed pitch propeller. This gave a service speed of about 7 knots. The approximate fuel consumption of this engine at its service revolutions would be about 14 litres per hour. The vessel was carrying approximately 2300 litres of diesel fuel when it left Nelson. She would therefore have had sufficient fuel for 15 to 20 days depending on the hours of engine use.

Mi Jay was a steel displacement vessel with a raised foredeck housing an anchor windlass mounted against the forward side of the wheelhouse. She had a pipe railing around the foredeck, extending aft on top of the bulwarks for about three quarters the length of the main deck.

Mi Jay had a black painted hull, a white over blue painted wheelhouse with four windows on each side and three windows across the front. Situated on the port side of the wheelhouse was a sliding perspex type window, which was beside the helm position. The only access into the wheelhouse was via a hinged steel door with a household type handle on the aft port side of the wheelhouse. This door had an aluminium opening household type window. The four person life raft was situated in a centre forward position on the monkey island, with the main mast and radar located abaft and above.

The main engine exhaust ran from the engine room up the back of the wheelhouse through the deckhead and faced aft. A cover was situated on the forward part of the main work deck abaft the wheelhouse extending to each side of the vessel. It's construction consisted of a 25 mm box section steel frame which was covered by sheet metal and secured by bolts.

The only access to the forecabin accommodation was via a hatchway at the forward end of the wheelhouse. This was normally covered with a piece of plywood when not in use. There was no means of securing this hatchway. To access the bunks below there were about five steps leading to the forecabin space which gave about 1.8 metres of headroom.

The vessel was fitted with a fish hold abaft the wheelhouse which was covered by a heavy steel hatch, and secured by standard hatch dogs.

Mi Jay also had an aft lazarette area, which housed a small amount of storage space and the steering gear. A flush mounted aluminium centre dog hatch covered this space.

Extending approximately three quarters the length of the working deck, were several freeing ports that were permanently open to the sea. The previous Skipper of the vessel stated that the freeing ports enabled any water that shipped on board to escape easily over the sides of the vessel. A small length of handrail situated immediately abaft the long line gear on top of the bulwarks at the stern had been cut away.

Despite extensive enquiries the Investigator was unable to obtain any previous plans of the vessel, save for that shown in *Figure 1* below.

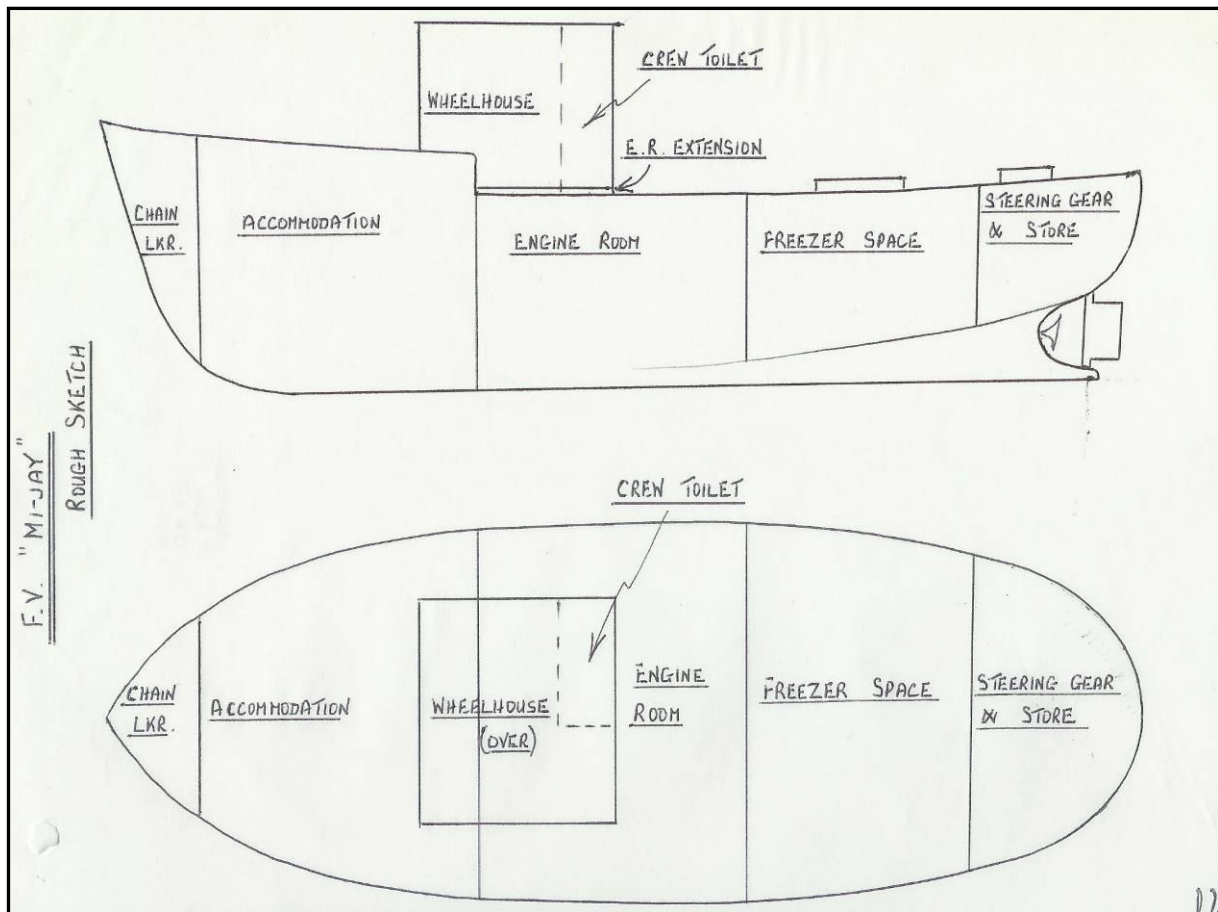


Figure 1
Sketch of *Mi Jay* obtained from the Ministry of Transport file.

Skipper

The Skipper Mr Paul Kemmeys Rees was aged 52. He held an Inshore Fishing Skipper's (IFS) Certificate. He gained this in November 1976 and it was endorsed for the fishing vessels *Waimarie II* & *Helena* to operate in Zone 36 & 35. The trip departing 22 November 2005 was the first one for Mr Rees as Skipper of *Mi Jay*.

Crew

Mr Rees recruited two crew for the voyage. Cedric Albert James was to be the senior crewmember on the deck of *Mi Jay*. He had about 10 years experience crewing on a variety of fishing vessels. Wiremu Te Kapu Albert Tawhiti was the other crew; he was less experienced but had worked on some fishing vessels.

Both crewmembers had worked on various vessels but neither had any formal training.

PREPARATION & VOYAGE

During the winter of 2005, *Mi Jay* fished intermittently for blue cod around the top of the South Island. The last blue cod potting trip ended on 28 July 2005, with the catch unloaded on 1 August 2005.

On 2 October 2005 the vessel took bunkers consisting of 1492 litres of diesel, which topped up the fuel tanks. The vessel was then laid up in Nelson until approximately mid November 2005, at which time Paul Rees took over as Skipper.

The Owner and Mr Rees then went about setting up the vessel with a new long line hauler, hook magazines and various other items needed to undertake a bottom long lining venture.

Mr Rees recruited Cedric James to help supervise the Deckhand during fishing operations. Together they started to get the vessel ready for fishing. The Owner installed a new autopilot and chart plotter and had various repairs made to the steering gear and other equipment to get the vessel fully operational.

Mi Jay departed Talley's wharf, Port Nelson, at approximately 1500 hours. The vessel was next seen passing an area towards Pepin Island in Tasman Bay at approximately 1630 hours.

At 1830 hours, another vessel observed *Mi Jay* in a position just north of Croisilles Harbour heading for French Pass.

On 23 November 2005 at 0346 hours, Mr Rees sent a text message from his mobile phone to a former employer and friend in Wellington. This text went via the Vodafone Karori cell phone site, which has an approximate range, over water, of about 70 kilometres or 37.7 nm. A reply came back at about 0800 hours, and Mr Rees sent a final text via the same cell phone site at 0829 hours on 23 November.

At 1242 hours, the same day, a phone call was made to a Wellington number from the vessel's cell phone. This was also via the Karori cell phone site. During this time the vessel was within approximately 37 NM of Karori or the greater Cook Strait area. Despite the presence of a number of fishing vessels, there were no sightings of *Mi Jay* as she transited Cook Strait. The weather was still rough but abating from a southerly front that had recently passed through the area.

There were no further reported sightings of the vessel.

COMMENT & ANALYSIS

Evidence

Maritime NZ commenced an investigation into the loss of *Mi Jay* as soon as the Director of Maritime NZ officially called off the search.

Interviews were conducted with the Owner and eyewitnesses who saw the vessel before her departure, including contractors working onboard. Previous crew of the vessel were interviewed as well as friends of the two crewmembers.

Documentary evidence was gathered from RCCNZ, New Zealand Police, MetService, Fishserve, SGS-M&I the vessel's Safe Ship Management Company, RFD life rafts the manufacturers of the life raft, M-Fish and Sunderland Marine Insurance, the vessel's hull insurers.

Analysis

Manning

The vessel was required to be manned in accordance with **Maritime Rule Part 31C.10 - Offshore Area within 100 NM of NZ**.

This Rule states the Skipper must hold a New Zealand Offshore Master (NZOM) Certificate. The vessel must carry a person holding a Marine Engineer Class 6 (MEC-6) Certificate. A Skipper may also be the engineer in this case, but there must be a minimum crew of two.

Mr Rees did not hold the correct maritime qualifications to act as Skipper on *Mi Jay*. The Owner assumed Mr Rees held the correct Certificate but did not ask to see it for confirmation. Mr Rees had not been formally assessed as a Skipper, but had operated various vessels during the last 30 years.

The Owner gave Mr Rees a familiarisation tour of the vessel along with Mr James. They took the vessel outside the harbour to test run the new autopilot. No formal procedures were followed by the Owner when he employed a new Skipper and crew. For example the Owner did not verify the manning of the vessel or formally walk through any hazards or operating procedures for the vessel.

Safe Ship Management

Mi Jay was required to be in a Safe Ship Management System (SSM) and hold a valid SSM Certificate. The SSM Certificate for *Mi Jay* was issued by SGS-M&I on 6 December 2004 and was due to expire on 30 November 2005.

SGS-M&I had written to the Owner on 28 October 2005, asking him to present the vessel for its 4 yearly out of water survey on or before 30 November 2005. The Owner stated that he attempted to get the vessel onto the slip at Port Nelson for an inspection of the propeller shaft and rudder, but space was not available at the time. He did not approach SGS-M&I for assistance in getting an exemption from Maritime NZ before the vessel sailed on 22 November 2005. The vessel did have a valid SSM Certificate but only until 30 November 2005, when the Owner claimed that the vessel would be home.

Maritime Rule Part 46.17(1)(b) - Inspections requires an Owner to ensure that the propeller shafts and rudder-stocks are inspected at a period not exceeding 4 years.

Maritime Rule Part 21.12.1(b) - Safe Ship Management Systems requires an Owner to ensure the SSM Certificate is for the time being in force in respect of the ship.

The Owner stated that he had stored the vessel for 10 days and that there would have been enough canned goods and fish to extend to a 14 day voyage.

Safe Ship Management Manual

The vessel's SSM manual contained various procedures for the safe operation of **Mi Jay**. One of these was 2.3 'Radio Reporting Schedules'. 2.3.1 'Reporting Interval', this stated:

"twice-daily reporting schedule will be made when the vessel is at sea."

2.3.6 stated:

"The master will determine the appropriate frequency for the operational area and the appropriate schedules reporting times, in consultation with the Owner, prior to commencing any voyage. The Master will also ensure that the communications equipment on the vessel is operational on the selected frequencies."

Neither of the above was conducted by the Skipper or Owner both before and following the vessel's departure from Nelson.

Inspections & Surveys

SGS-M&I conducted the last documented survey of **Mi Jay** in December 2003. A number of deficiencies were raised at the time, but had been all closed out by 30 January 2004.

On 28 October 2005 SGS-M&I sent a 'defects resolution' letter to the Owner regarding defects not yet closed out, from a survey that was carried out by SGS-M&I in December 2004. There is no documentation available pertaining to this survey which is presumed to have been lost.

Mi Jay was last inspected by Maritime New Zealand in November 1998 in Milford Sound. One deficiency, "*Maintenance Plan Details*", was found. It is not known what the maintenance plan referred to or if was ever closed out.

Wheelhouse Equipment

The vessel was fitted with the following electronic items:

Equipment	Make/Model
SSB Radio:	JRC
VHF Radio:	Uniden
Radar:	Furuno FR701
Magnetic Compass:	150MM Saura
Echosounder:	Furuno FCV211
Autopilot:	Wagner
GPS:	Nobletech plotting system via laptop interfaced with SSB

There is no documented evidence of either the SSB or VHF radio's having been surveyed. **Maritime Rule Part 43.6(3)** requires that any radio installation fitted to the vessel is surveyed when installed and at 4 yearly intervals after installation, and at intermediate periods as may be determined by the Safe Ship Management company. The autopilot and plotting equipment had been installed the week before departing Nelson on 22 November 2005. It had been tested at sea and was found to be operating satisfactorily.

Life Saving & Fire Fighting Appliances

The vessel was listed as having two lifejackets on board at the last documented survey in December 2003. The last Skipper who had sailed on the vessel, said the vessel carried four lifejackets. These were stored on one of the top bunks in the forecastle accommodation area.

According to the last documented survey, the vessel carried five parachute flares and two buoyant smoke floats. The parachute flares expired in September 2004 and the smoke floats in July 2004. These were stored in a rack along the forward bulkhead of the inside of the wheelhouse. There is no documented evidence to indicate that either of these items was renewed.

The vessel carried a Seasava Plus four man life raft; (*See Photographs 1-7 of Appendix 1*) this was last serviced on 26 April 2005.

The vessel was equipped with a 121.5 MHz Emergency Position Indicating Radio Beacon (EPIRB). This was due for service before March 2006. The EPIRB was located just inside the wheelhouse door and secured to the bulkhead in its storage bracket. The relevant Maritime Rule (Rule 40D.68) required that fishing vessels operating within offshore limits carry a 406 MHz EPIRB.

The vessel carried a 7lb CO₂, a 2.0 kg Dry powder and a 4.5 kg Dry Powder fire extinguishers which were kept in the wheelhouse. They were all due to be serviced before 16 December 2005.

Life Raft Details

A tourist helicopter pilot found the life raft on 19 December 2005, approximately 15 NM south east of the Kaikoura Peninsula. Police using a local fishing vessel later recovered the raft. The raft had a heavy covering of marine growth on the underside. The growth was analysed and was found to be between 21 and 28 days old. This would suggest that the raft was launched sometime during the week of 23 to 30 November 2005.

RFD Report on Liferaft

Maritime NZ requested the manufacturers of the liferaft, RFD, to conduct a full inspection of the recovered liferaft. Their report is attached as an Appendix to this report. The Conclusions are:

Conclusions

- 1. The liferaft had been successfully deployed and had stayed afloat for some considerable time despite being severely damaged. It appears that the canopy had been deliberately removed and the arch tube severed by a relatively sharp object. The damage to the arch tube would have resulted in a large loss of gas from the upper buoyancy chamber, reducing the rafts freeboard, and reducing the amount of shelter offered by the buoyancy tubes. The rigidity of the raft would also have been compromised. The canopy is designed to provide a fully enclosed, sheltered environment in which survivors can shelter. Removal of the canopy would leave the rafts occupants open to the elements with all the associated risks. It also removes the main means of collecting rain water for drinking, as well as a large measure of security for both occupants and equipment.*

2. *The drogue was missing from the raft and could have been severed by wreckage. The rode from the drogue was still present but not attached to the raft. I am unable to suggest what sequence of events led to this. The rescue line and quoit were also missing.*
3. *The safety knife blade had become detached from the handle. As mentioned earlier, due to the appearance of the blade, I can only speculate that the knife had been used extensively and had broken due to the application of excessive cutting force. This suggests that the knife may have been used to cut the arch tube as well as the canopy.*
4. *Most of the emergency equipment was missing. The equipment bag is tied securely to the raft during survey, and should remain so even when the liferaft is used, with equipment being removed from the bag, and then (if necessary) replaced and the bag re-tied. If this was not done, and with the liferaft canopy removed, the contents of the emergency pack would have quickly been lost overboard, especially in a rough sea. The presence of the torch lens retaining ring indicates that the occupants opened the emergency pack at some point.*
5. *This raft equipment pack had a Davis Echomaster radar reflector fitted, but this too was absent assumed lost overboard. There was no EPIRB fitted in this liferaft.*
6. *The end of the painter line was not heavily frayed like that of the drogue, suggesting that this had been cut by the occupants, as part of the prescribed raft deployment procedure.*

The author of the above report was unable to explain why the two crewmembers would have decided to remove the canopy to the liferaft or sever the arch tube. He could only surmise that this was done due to a lack of training, understanding and knowledge of the crew as to the design construction and operation of liferafts generally.

Possible Passage & Sightings

Mi Jay was seen departing Port Nelson between 1430 hours and 1500 hours on Tuesday 22 November 2005. She was next seen passing an area at the eastern end of the Boulder bank known as 'The Glen' at about 1630 hours. She was also observed by another fishing vessel heading for French Pass at about 1830 hours, just north of Croisilles Harbour. This represented the normal track a vessel would take when transiting from Nelson to the east of the South Island via French Pass.

No ten minute call was recorded on VHF channel 16 at French Pass as required. The Cook Strait cable protection vessel, *Sea Surveyor*, observed and tracked a target by radar travelling at about 7 knots south through Cook Strait on 23 November 2005. The track started at 0329 hours, near Fishermans Rock and transited Cook Strait in a south-south westerly direction. About half way through the Cook Strait Cable Protection Zone, the target made an alteration to port on to a more southerly heading. At 0600 hours, the radar lock was lost.

There were a number of fishing vessels in the Cook Strait area during the above time. However, no one sighted the vessel that was tracked by *Sea Surveyor* or saw any vessels matching the description of *Mi Jay*.

At 0346 hours, on 23 November 2005, a text was sent from Mr Rees' mobile phone. This went via the Vodafone Karori cell phone site. At 0829 hours another text was received and sent back via the same site. These texts were to a previous employer of Mr Rees, and were of a social nature. No mention was made of the trip.

At 1242 hours on the same day, a phone call was made on the vessel's mobile phone; this was via the Karori site. This site has an estimated coverage range over water of approximately 70 kilometres or 37.7 NM. This call was to the Wellington Shelter.

The Owner thought Mr Rees was going to go fishing at an area called Mernoo Bank. This bank is situated approximately 90 NM southeast of Kaikoura Peninsula.

Evidence from a previous employer of Mr Rees suggests that he may have gone to an area about 60 NM northeast of Mernoo Bank, known by his company as Maori Acre (See Figure 2). Mr Rees had previously fished there for grouper during October 2005.

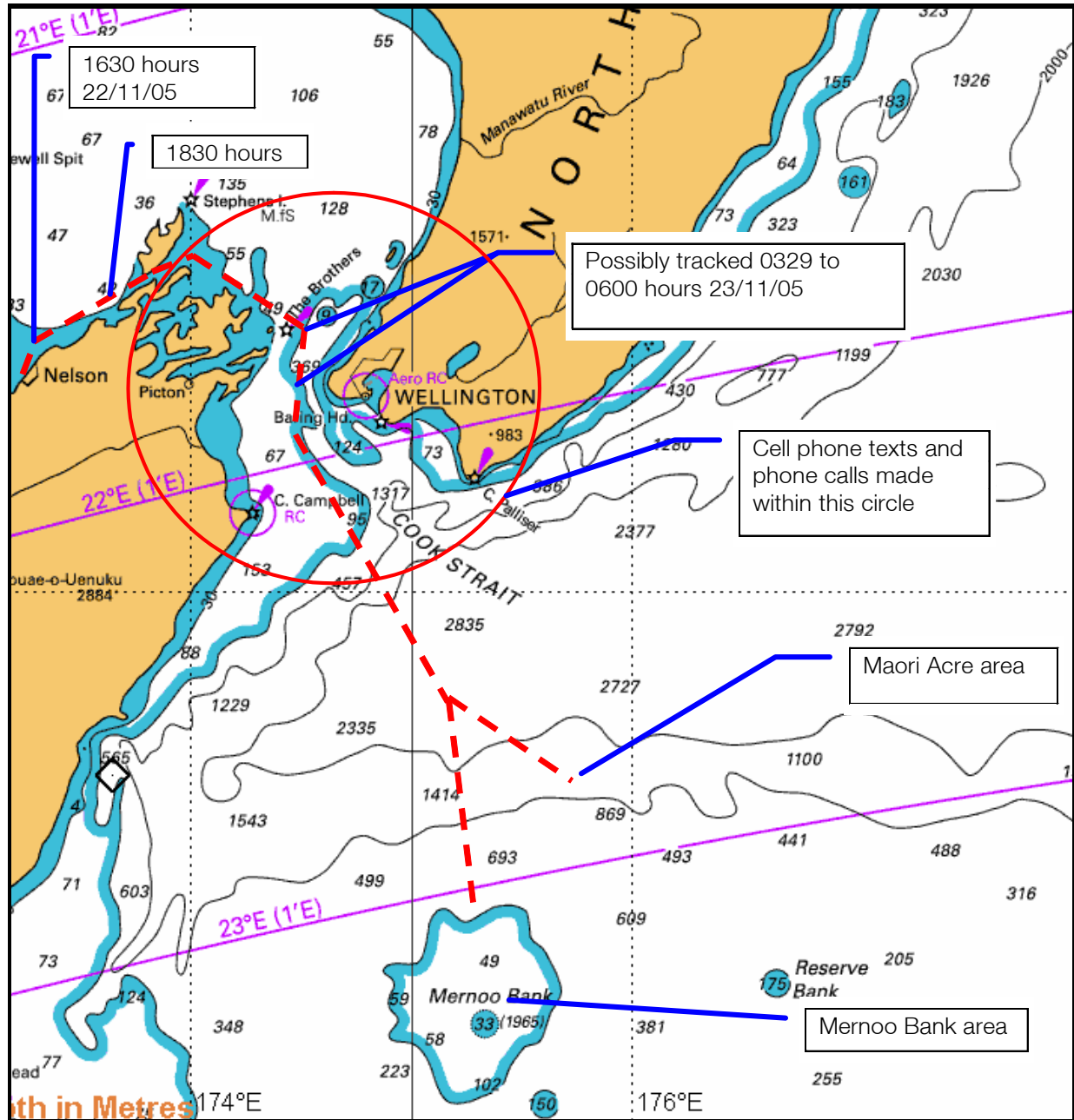


Figure 2
Chart of probable passage.

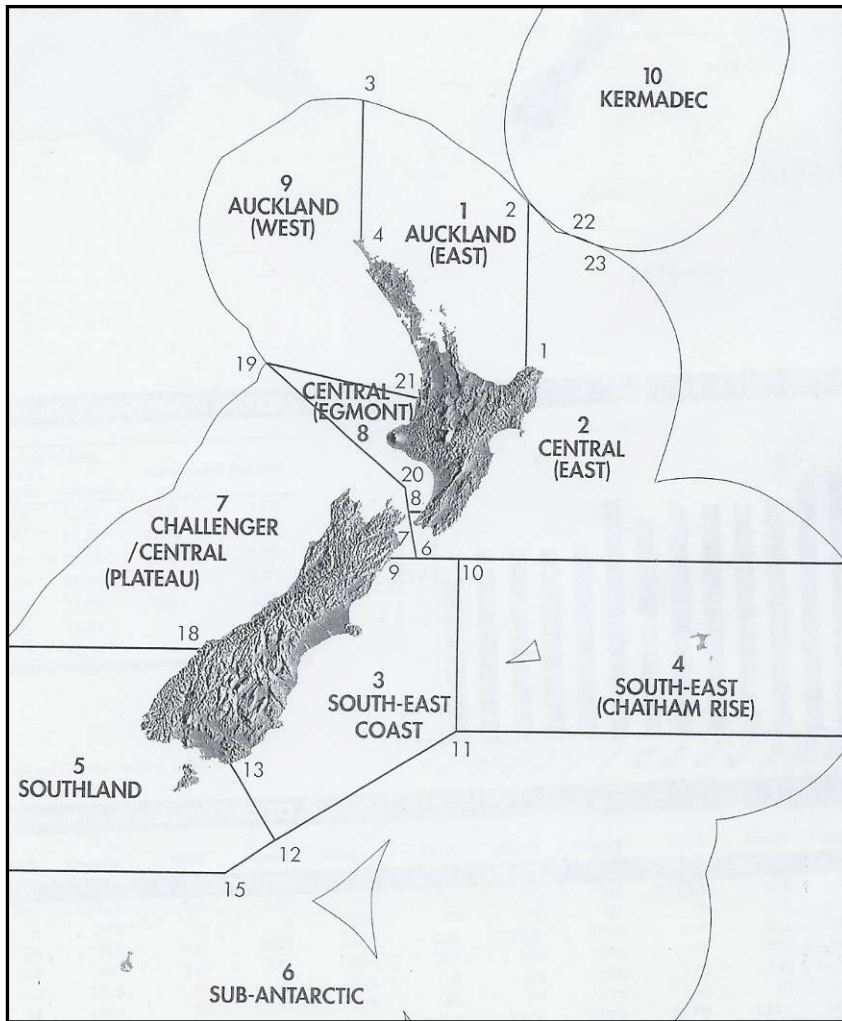


Figure 3
 Chart showing the Ministry of Fisheries, New Zealand fisheries management areas.

Mr Rees and the Owner planned to catch grouper and bluenose in areas 3 and 4. This covered the Mernoo Bank and Maori Acre fishing areas. They planned to bottom long line using a semi automated long line system.

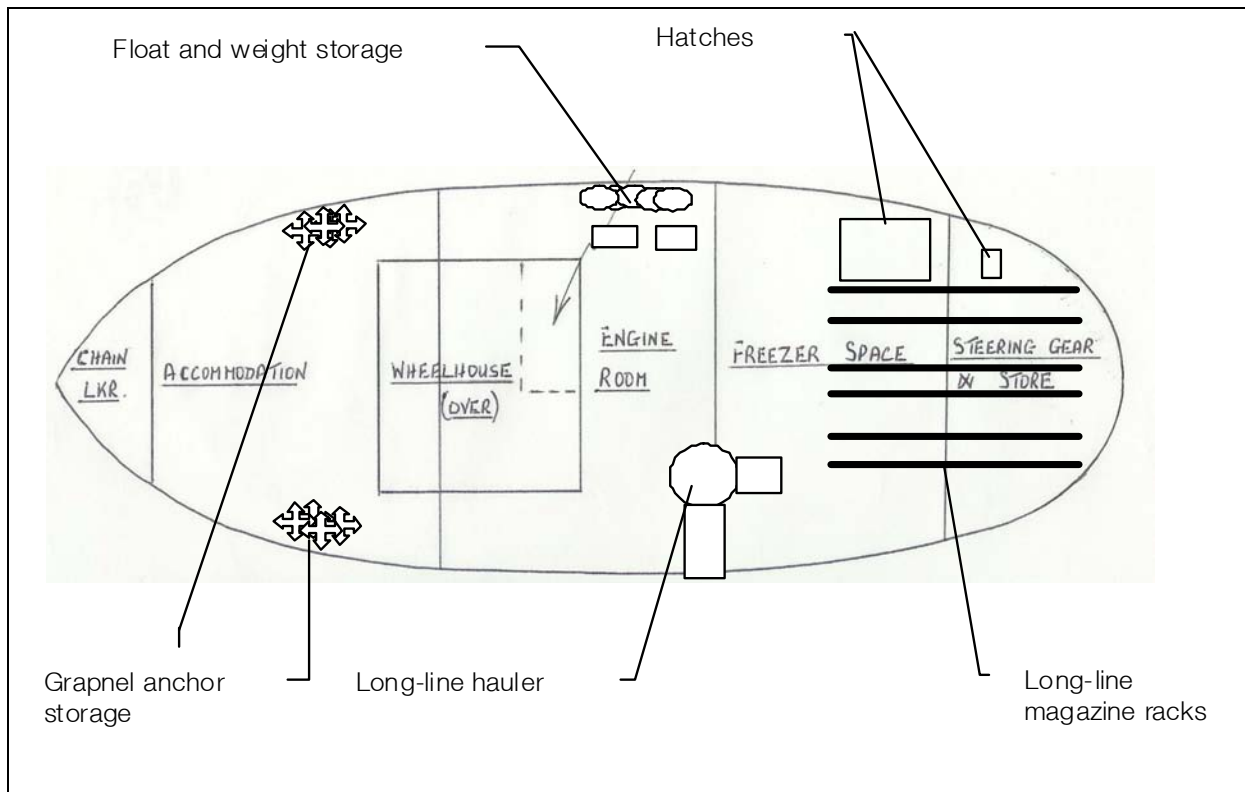


Figure 4
Fishing gear as stored on deck of *Mi Jay*

Loading

The manufacturer of the line hauler stated that it weighed about 200 kilograms (kgs). It is estimated that the weight of the long line backbone, and hooks would weigh no more than about 300 kg. They had 8 grapnel anchors weighing between 15 and 20 kgs each giving a total of between 120 and 160 kgs. There was also half a box of intermediate weights made of plate steel, weighing approximately 3 to 5 kgs each with a total weight of about 150 kg. The steel and tubing used in the construction of the magazines and the racks would have weighed approximately 100 kgs.

The total estimated weight of the long line system attached on deck would have been about 700 to 910 kgs.

While trolling for albacore tuna during the 04/05 summer, the previous Skipper of *Mi Jay* said he had at least 1500 kgs of fish stored on deck with no adverse stability effects.

Mi Jay had taken 1492 litres of diesel onboard on 2 October 2005. This filled the tanks to their capacity of 2400 litres. On 22 November she loaded approximately 3 tonnes of ice that was divided into pounds of approximately $\frac{1}{3}$ by volume athwartships, and 300 kgs of long line bait. Approximately 750 litres of fresh water, stored in wing tanks, was also taken on board at the time.

Environmental Conditions, Cook Strait Area

MetService Forecasts and Observations

The information displayed in this sub section is for the transit voyage only. The forecast areas are for Cook Strait, Castle Point, Conway and Chatham Islands.



Figure 5
Coastal forecast areas.

Forecast issued 1230 hours, 22 November 2005.

This was the last forecast issued before *Mi Jay* sailed from Nelson.

COOK

GALE WARNING IN FORCE

Southerly 35 knots easing to 25 knots this evening, then dying out around midday Wednesday. Northwest 10 knots developing in the afternoon and rising to 20 knots in the evening. Very rough sea easing. Northerly swell 1 metre dying out. Southerly swell 2 metres easing.

CASTLEPOINT

Southwest 30 knots easing to 20 knots in the morning and tending northwest Wednesday evening. Rough sea easing. Southwest swell 2 metres easing. Fair visibility in showers clearing in the morning.

CONWAY

Southwest easing to 25 knots this afternoon and to 15 knots this evening. Becoming variable 10 knots late morning, then rising to southwest 30 knots late Wednesday evening. Rough sea easing for a time. Southwest swell offshore 2 metres easing. Poor visibility in rain from Wednesday evening.

CHATHAM ISLANDS

Southwest 15 knots rising to 25 knots overnight. Sea becoming rough. Northwest swell 3 metres easing. Southwest swell 2 metres. Poor visibility in showers.

Forecast issued at 0056 hours 23 November 2005

At this time it is probable that *Mi Jay* was making passage in Cook Strait to the north of the Marlborough Sounds.

COOK

Southerly 20 knots dying out around midday. Northwest 15 knots developing this afternoon. A change to southerly 20 knots tonight. Moderate sea easing for a time. Southerly swell easing to 2 metres.

Fair visibility in scattered rain developing tonight.

CASTLEPOINT

Southwest 25 knots easing to 15 knots early afternoon then tending northwest 20 knots in the evening. Rough sea easing. Southwest swell easing to 2 metres.

CONWAY

Southwest 15 knots then tending northeast 10 knots about midday. Becoming southwest 30 knots this evening. Sea becoming rough. Southwest swell easing to 2 metres. Poor visibility in rain developing this evening.

CHATHAM ISLANDS

Southwest 15 knots rising to 30 knots this morning. Sea becoming rough. Northwest swell 2 metres easing. Southwest swell 2 metres. Fair visibility in a few showers developing this morning.

Forecast issued 1236 hours, 23 November 2005.

At this time it is probable that *Mi Jay* was in the eastern Cook Strait area.

COOK

Northerly 15 knots. Becoming southerly 20 knots tonight, and then rising to 30 knots for a time from late morning to Thursday afternoon. Sea becoming rough for a time. Southerly swell 2 metres. Fair visibility in overnight showers.

CASTLEPOINT

Southwest 15 knots tending northwest this evening. Becoming southwest 20 knots early morning. Sea becoming moderate. Southwest swell 2 metres. Fair visibility in overnight rain.

CONWAY

Northeast 10 knots. A change to southwest 30 knots spreading north this evening then easing to 20 knots late morning and to 10 knots Thursday night. Sea becoming rough for a time. Southerly swell easing to 2 metres for a time. Poor visibility in rain this evening.

CHATHAM ISLANDS

Southwest 30 knots. Sea rough. Southwest swell rising to 3 metres. Northwest swell 2 metres easing. Fair visibility in a few showers.

The observations set out below cover the time that *Mi Jay* would have transited Cook Strait.

Brothers Is AWS				
Date	Time (NZDT)	Wind Direction	Speed Knots	Maximum Gust Knots
22/11/05	12:00	160	38	46
23/11/05	00:00	170	21	28
23/11/05	12:00	20	10	14
24/11/05	00:00	30	14	20
24/11/05	12:00	170	27	32

Palliser Ngawihi AWS			
Date	Time (NZDT)	Wind Direction	Speed Knots
22/11/05	12:00	210	18
23/11/05	00:00	200	11
23/11/05	12:00	250	2
24/11/05	00:00	140	8
24/11/05	12:00	210	13

Cape Campbell AWS			
Date	Time (NZDT)	Wind Direction	Speed Knots
22/11/05	12:00	180	26
23/11/05	00:00	180	11
23/11/05	12:00	70	3
24/11/05	00:00	150	9
24/11/05	12:00	170	21

Figure 6

MetService data from weather stations

Environmental Conditions, Probable Fishing Area

The information set out below is from the MetService. This is displayed for the weather station sites that are considered to be the closest to the most probable fishing areas used by *Mi Jay*.

Cape Campbell AWS			
Date	Time (NZDT)	Wind Direction	Speed Knots
25/11/05	00:00	170	19
25/11/05	12:00	170	22
26/11/05	00:00	150	20
26/11/05	12:00	170	22
27/11/05	00:00	190	12
27/11/05	12:00	150	22
28/11/05	00:00	170	21
28/11/05	12:00	170	23
29/11/05	00:00	170	17
29/11/05	12:00	130	6
30/11/05	00:00	200	5

Palliser Ngawihi AWS			
Date	Time (NZDT)	Wind Direction	Speed Knots
25/11/05	00:00	200	17
25/11/05	12:00	190	12
26/11/05	00:00	140	7
26/11/05	12:00	180	14
27/11/05	00:00	80	6
27/11/05	12:00	170	16
28/11/05	00:00	170	8
28/11/05	12:00		
29/11/05	00:00	180	15
29/11/05	12:00	150	6
30/11/05	00:00	0	0

Kaikoura AWS				
Date	Time (NZDT)	Wind Direction	Speed Knots	Maximum Gust Knots
25/11/05	00:00	230	17	23
25/11/05	12:00	190	13	20
26/11/05	00:00	270	7	10
26/11/05	12:00	190	17	21
27/11/05	00:00	270	7	9
27/11/05	12:00	190	14	17
28/11/05	00:00	290	5	7
28/11/05	12:00	250	7	11
29/11/05	00:00	VRB	1	4
29/11/05	12:00	50	11	17
30/11/05	00:00	240	6	7

Figure 7

MetService observations from 25 to 30 November 2005.

Tidal Flow Conditions

Based on information from the New Zealand Nautical Almanac, the following tidal flow information for Cook Strait was determined. On 22 November 2005 at approximately 2030 hours the tidal flow started to set to the north through Cook Strait. At 0231 hours, on 23 November it commenced flowing to the south until about 0839 hours when it changed to the north again. At 1458 hours, the flow was to the south and then to the north again at 2127 hours.

The two periods of note are the two south flowing tidal changes. One started at approximately 0231 hours, when *Mi Jay* had a probable position somewhere near to The Brothers Island, Fishermans Rock and Cook Rock area. The second was at 1458 hours, when *Mi Jay* had a probable position somewhere in the eastern area of Cook Strait. During both these times the tidal flow was against the prevailing southerly winds and swells, which would have steepened the face of the waves.

Wave Information

MetOcean Solutions Ltd produced a wave data model for the Mernoo Bank Area for November 2005. This was in a tabulated format. The key headings and points of note have been summarised by the Investigator and are as follows for the period between 24 to 30 November 2005:

- The significant wave heights measured in metres were, from 1.8m to 3.9m.
- Peak wave periods measured in seconds were, from 7.0s to 11.9s.
- Peak direction measured in degrees true was, from 205° to 072°.
- Highest probable waves measured in metres were from 3.3 m to 7.2m.
- The worst wave period throughout the data set was during 24 November.

Using this data for a wave that has a height of 7.2 m, a period of 8.4 in water with a depth of between 50 and 500 metres the speed of this wave can be calculated at 5.2 knots. This speed is approximately 70% of the service speed of *Mi Jay*. This does not take into account any effects that the wind would have had as it acted upon the vessel. The wave becomes steeper the shallower the water, if *Mi Jay* had been near the shoaling water near the top of Mernoo Bank at a depth of 33 metres then the waves would have been very dangerous indeed.

Fishing Vessel Observed Environmental Conditions

A number of fishing vessels were contacted and asked to give their opinion of the actual weather conditions they experienced in late November 2005.

One Skipper described the weather in mid Cook Strait during late 22 November 2005 as, “35 knots 2-3 metres from the south”. They had to reduce pitch (slow down) from normal steaming due to the sea conditions.

Another said the weather in Cook Strait during the day of 23 November 2005 was rough but with wind and sea abating by afternoon and about a 2 metre southerly swell.

Bridge logs were obtained from two large trawlers operating around Mernoo Bank and north towards the Chatham Rise. For the week of 23 to 30 November 2005, the average wind strength was between 22 to 27 knots from southeast through to southwest, and an average swell height of 3 metres. The maximum wind strength recorded was 40 knots on 24 November 2005, from the southwest and a maximum swell height of 6 metres.

Position Reporting

As stated in the Safe Ship Management section of this report, the SSM system for *Mi Jay* had procedures in place to set up a radio reporting schedule as agreed between Owner and Skipper. Currently there is no requirement in force that requires vessels to report their position at sea. Reports from Maritime New Zealand into the loss of the fishing vessels *Endeavour III* in 1998 and *Moeraki Bay* in 2001, in which there were significant delays in reporting the vessels overdue, highlight the importance of regular position reporting to a nominated person ashore.

A Marine Notice (04/1999) was issued by the then Maritime Safety Authority, which recommended that Skippers give serious consideration to voluntarily reporting their positions, courses and speeds at the same time each day to a nominated person ashore. Also, to establish a procedure for the nominated person to follow should a vessel fail to make contact within a scheduled reporting period. The Notice recommended that a broadcast signal on VHF or HF was preferable to telephone calls because of their ability to reach more than one receiver simultaneously. Additionally, it was recommended that a “float off” 406 kHz EPIRB be used which activates automatically.

There is no mandatory reporting requirement in similar maritime districts such as Australia and the USA.

Search & Rescue Details

At 0900 hours on 6 December 2005 the Owner called the Rescue Coordination Centre of New Zealand (RCCNZ) in Wellington.

Shortly after this call, RCCNZ put out an all stations call via the Wellington, Kaikoura and Akaroa repeaters, on VHF channel 16 and HF channel 2182,4125 and 6215. The message was to ask if anyone had seen ***Mi Jay***.

At 1000 hours an Airforce Orion was tasked to search the most likely fishing area near Mernoo Bank for ***Mi Jay***. The aircraft searched for the vessel but did not sight it (*See Figure 2*).

RCCNZ extended the all stations call to more VHF sites around the country on a two hourly basis. On 8 December two shoreline searches were carried out by a helicopter. One search involved the south Wairarapa Coastline, the other Marlborough to North Canterbury coastline. Nothing was found during these searches.

From 8 December RCCNZ changed the all stations call to a 4 hourly schedule. Based on new information the search shifted to an area known as Maori Acre, which is approximately 50 nm west of the Chatham Islands (*See Figure 2*).

On 10 December a light plane made a shoreline search around the Chatham Islands with no result. An Orion was also tasked to search an area east of the Chathams; this search was to look for a most likely area a life raft could have drifted to.

During 12 and 13 December further unsuccessful searches of the Chatham Islands were undertaken by a boat and light plane.

On 17 December, the Director of Maritime New Zealand suspended the search for ***Mi Jay***.

On 19 December, the vessel's life raft was found approximately 15 NM south east of the Kaikoura Peninsula.

On 21 December the search for ***Mi Jay*** was formally terminated.

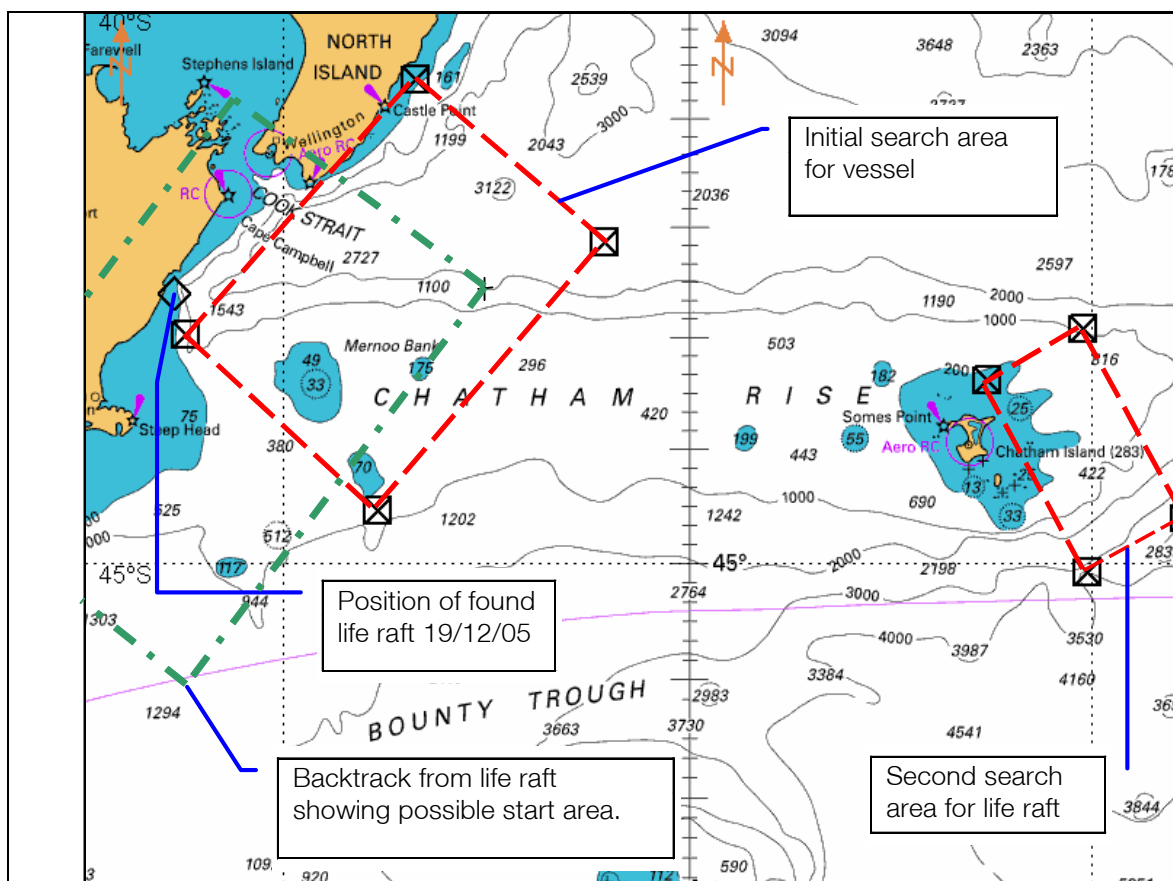


Figure 8
Chart of the search areas.

Post Mortem Report

The pathologist found that Mr James and Mr Tawhiti died about 7 to 10 days before the raft was found on 19 December 2005. He found the cause of death for both crewmembers to be an undetermined anatomical cause, probably dehydration, inanition and hypothermia. He raised the fact that there was the presence of carbon pigment within the lungs only. This he thought could be attributed to a lifetime of smoking or inhalation of smoke and soot, although there was no other evidence of fire damage to the bodies or clothing. Mr Tawhiti was fully clothed and Mr James was all but naked. There was enough clothing floating in the raft for Mr James to be completely clothed. Mr Tawhiti was found to have \$22 rolled in one of the legs of his pants.

Vessel Monitoring System

New Zealand has a Vessel Monitoring System (VMS) that is operated by the Ministry of Fisheries (M-Fish).

All New Zealand registered fishing vessels over 28 metres in length are required to carry an Inmarsat C system. Fishing vessels of any length that are operating outside the 200 NM EEZ must also carry this system.

In Australia, the Australian Fisheries Management Authority has implemented a vessel monitoring system for all Commonwealth fishing vessels; This system was still being rolled out at time of writing.

The United States does not have a national system of vessel monitoring, but instead has a regional/seasonal/fishery based system. The National Oceanographic & Atmospheric Agency (NOAA) monitors this. They monitor only certain types of fisheries in particular areas of interest. The U.S Coastguard has an Automated Identification System (AIS) in place for various vessels but at this time this does not cover fish catchers. In the near future, they plan to expand upon this to include amongst others all fishing vessels over 65 feet in length.

The United Kingdom has a mandatory VMS for all fishing vessel over 24 metres in length. Below this size VMS is voluntary only. This information is available for SAR as well as enforcement of fisheries regulations

There is the technology available in the form of Inmarsat D+ and Iridium 9601. Both these units can be configured to send a signal giving its position at a predetermined time. One of these units can use an existing GPS receiver aerial and only requires a 12-volt input for operation.

CONCLUSIONS

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

- The Owner failed to maintain contact with his vessel after she departed Nelson, despite the fact that the Skipper was new to the vessel and the owner had no firm idea of the vessel's destination or for how long she would be away.
- The Skipper was not appropriately qualified for the operation proposed. The vessel was not equipped with a 406 MHz EPIRB as required by the Maritime Rules.
- The Owner stated that he bought stores for the vessel that would last for about 10 days; he said that if the crew used the canned goods already on board that there was sufficient food for about 14 days. It was on this basis that he called RCCNZ on the fourteenth day after the vessel's departure, although, barring any unexpected problems, he had expected the vessel to return to port after about a week.
- The vessel's Safe Ship Management Certificate was due to expire shortly after the vessel departed port.
- Based on the information gained during the analysis of the life raft, it is likely that the raft was in the water for at least 21 days, possibly up to 28 days. The pathology report suggests that Mr James and Mr Tawhiti died seven to ten days before the raft was found, so would have been alive for about 11 to 14 days while RCCNZ conducted the search. If the alarm had been raised earlier and if RCCNZ had the last known position of ***Mi Jay***, then the three crew would have had a far greater chance of rescue.
- There are no survivors or signs of any wreckage/equipment from ***Mi Jay***, which might assist in determining the factors which contributed to the disappearance of this vessel. It is unknown whether bad weather may have been a factor although a vessel such as ***Mi Jay***, should have been able to withstand the weather conditions prevailing at the time.
- The lack of instruction or understanding by the Owner as to exactly where ***Mi Jay*** was to fish, made it extremely difficult to locate the vessel, any wreckage or equipment or, as it turned out, the life raft. The fact that no distress message was ever received from the vessel, either by VHF/SSB radio or an EPIRB, suggests that the vessel may have become overwhelmed by a sudden catastrophic event. If the crew had had time to raise the alarm before abandoning the vessel, it is possible that other vessels in the vicinity and Maritime Radio would have heard them, which would have increased the likelihood for rescue of surviving crew members.
- While it seems likely that the vessel was overwhelmed by a catastrophic event during the week of 23 to 30 November 2005, it is not possible to identify any particular cause or causes of the apparent sinking.
- The possibility of ***Mi Jay*** being in collision with another vessel cannot be excluded. However, if this had occurred, one would have expected some signs of wreckage from the vessel to be visible and possibly a notification from the other vessel that such an event had occurred. In respect of a large vessel, however, particularly in the prevailing weather conditions, the force of any impact might not have been readily apparent. No sightings of any equipment or fittings from the vessel other than the life raft have been reported.
- The two most likely scenarios are that the vessel foundered either in or near to Cook Strait, or the vessel reached either Mernoo Bank or Maori Acre areas and foundered. The drift analyses backtrack that was completed from where the life raft was found, suggests an area that fits both these possible scenarios.

- In September 1999, following the loss of the fishing vessel *Endeavour II* with the loss of all hands, the Maritime Safety Authority (MSA) issued a Marine Notice (No. 04/1999), which recommended that Skippers give serious consideration to voluntarily reporting their positions, courses and speeds at the same time each day to a nominated person ashore. Also, to establish a procedure for the nominated person to follow should a vessel fail to make contact within a scheduled reporting period. The Notice recommended that a broadcast signal on VHF or HF was preferable to telephone calls because of their ability to reach more than one receiver simultaneously. In the case of *Endeavour II*, there was a delay of 44 hours before she was reported overdue. The Notice also recommended the carriage of a "float off" 406kHz EPIRB, which would alert authorities in the event of a sudden accident.
- If the vessel had been equipped with an EPIRB in the life raft then this tragedy may well have been averted. Secondly, if the Owner/Skipper had followed the procedures for reporting the vessel's position as set out in the SSM Manual, or if the vessel had been fitted with a simplified VMS a search could have been narrowed down to the last known position of the vessel.

SAFETY RECOMMENDATIONS

1. That copies of this report be sent to all nautical training establishments, the New Zealand Fishing Industry Guild, New Zealand Federation of Commercial Fishermen, New Zealand Seafood Industry Council and to the publications Professional Skipper and Seafood NZ.
2. That the Director of Maritime New Zealand remind vessel owners and operators of the importance of mariners initiating a system of voluntarily reporting their positions, course and speed at a set time each day to a nominated person ashore or to a base radio station. Also, for the need to establish a procedure for the nominated person to follow should a vessel fail to make contact within a scheduled reporting period. The press release should also highlight the benefits of fitting a 406 MHz EPIRB to liferafts.
3. Stemming from recommendation 2 above, it is suggested that the fishing industry better utilise the Maritime Operations Centre (MOC). This can be in form of using VHF channel 16 or the various HF frequencies all easily accessible anywhere around New Zealand. To help fishers retain the confidentiality of their intended fishing area, it is suggested that they ring MOC on the free phone number and arrange a simple code so that only MOC know exactly where they are.
4. That Maritime New Zealand conducts an analysis to determine whether the carriage of satellite compatible 406 kHz EPIRB's in life rafts of all fishing vessels operating more than 12 nautical miles off the New Zealand coast should be made mandatory.
5. That the Director of Maritime New Zealand reminds owners and operators of their statutory obligations to ensure that their Skippers and crew are appropriately qualified and that the vessel correctly manned.

ACTION TAKEN

N.B. Readers of this report should note that the finalisation of this report was delayed and as a consequence some of the recommendations mentioned in this final report have already been actioned.

- RCCNZ has agreed with the Ministry of Fisheries that RCCNZ will have access to vessel monitoring information on a case by case basis.
- Maritime NZ has produced a number of articles in various industry publications highlighting the need for regular trip reporting.
- Maritime NZ has publicized the importance of trip reporting and promoted the switch to 406 beacons widely in the following ways:
 - Maritime NZ provided a 4-page trip reporting feature in the September 2006 issue of *Seafood NZ* magazine.
 - Maritime NZ's quarterly accident safety magazine *Lookout!* highlights the trip reporting or 406 beacons in its Lookout points.
 - Media releases from the Rescue Coordination Centre of New Zealand frequently promote the value of the 406 beacon as do RCCNZ spokespeople and these are readily used by news organisations.
 - Maritime NZ's "Stay on Top" campaign has four key safety messages: communications is one of these. Last year Maritime NZ launched a new television commercial – Stay on Top with Communications Equipment which targets recreational boaties, but will also reach commercial skippers. Associated print advertising material and give-aways (around 90,000 items per year) reinforces the communications message. Maritime NZ has been giving a weekly radio interview on Saturday mornings for 4 years and regularly pushes the communications message using recent incidents as examples.
 - A joint promotion on 406 EPIRBs 2 years ago by the Maritime NZ/Australia NZ Safety Boating Education Group.
- Maritime NZ publishes resources for the commercial sector that include trip reporting and emergency communications as essential safety requirements

APPENDIX 1 – RFD REPORT ON LIFERAFT

Maritime NZ requested the manufacturers of the liferaft, RFD, to conduct a full inspection of the recovered liferaft. Their report is set out in full below:

Liferaft Inspection Report

Inspection report prepared for Maritime New Zealand

For: RFD Seasava Plus 4 Liferaft

Serial Number 5408

Vessel: Mi Jay

22 December 2005

Details:

<i>Reason for investigation</i>	<i>To inspect liferaft and report findings/conclusions as requested by Dominic Venz, Accident Investigator, MNZ</i>
<i>Liferaft</i>	<i>RFD Seasava Plus 4, Serial No: 5408</i>
<i>Date of Manufacture</i>	<i>January 1989</i>
<i>Last Serviced</i>	<i>26/04/2005 at RFD Nelson</i>
<i>RFD Service Technician</i>	<i>David Chapman</i>
<i>Emergency Pack Type</i>	<i>MSA (NZ) B</i>
<i>CO2 Cylinder serial number</i>	<i>321665</i>
<i>CO2 Cylinder hydrostatic test date</i>	<i>August 1999</i>
<i>Cylinder Operating Head</i>	<i>Walter Kidde Marine Mk 1</i>
<i>RFD Service Certificate number</i>	<i>SN36048 Dated 26.04.05</i>
<i>Date Liferaft issued to Vessel post-survey</i>	<i>27.04.05</i>
<i>Manufacturer's Manual Reference</i>	<i>RFD Seasava Manual 060489009</i>
<i>Maritime New Zealand Applicable Rules</i>	<i>Rule 42A.11 & Rule 42A.12</i>
<i>International Life-Saving Appliance Code</i>	<i>Section 4.1</i>
<i>Report compiled by</i>	<i>David Chapman</i>

Background

This report was compiled as requested by Dominic Venz of the Accident Investigation Department, Maritime New Zealand. The object of this exercise was to attempt to evaluate the sequence of events that may have occurred prior to the raft being found drifting off the Kaikoura coast.

As such, the only factual comments I can make are those based on the physical state of the raft and its equipment when it was brought to RFD Nelson in December 2005.

The raft had been previously serviced by me on 26 April 2005 with an MSANZ B pack inside, and had been issued to the vessel owner on 27 April 2005.

Description

The Seasava Plus liferaft has two buoyancy chambers manufactured from polyurethane proofed nylon fabric. These are superimposed to form a high freeboard, and a self-erecting arch tube is connected, via a non-return transfer valve, to the upper buoyancy chamber. This tube supports a canopy to provide all weather protection, which has a door, vent and rain water collection system. The floor may or may not be inflatable depending on the options chosen at the time of purchase.

The raft is inflated using high pressure carbon dioxide and nitrogen gas, which is stored in a steel cylinder inserted in a pocket attached to the underside of the liferaft floor. The cylinder is fitted with a valve and operating head and is connected to the liferaft inflation valves by a steel reinforced, flexible air hose.

The Seasava Plus is furnished with the following fitted equipment:

- Internal and external life lines*
- Drogue (sea anchor)*
- Rescue line with throwing quoit*
- Boarding ramp and handles*
- Righting ladder*
- External light (with sea water activated battery)*
- Weighted water ballast pockets x 4*
- Retro reflective tape*
- Sheathed knife*
- Immediate Actions leaflet*

The emergency equipment pack consists of a polyurethane proofed nylon or PVC bag, secured by its draw strings to the life line inside the raft, close to the door. An MSANZ "B" pack contains the following items:

- Paddles x 2*
- Thermal protective aids x 2*
- Parachute rockets x 2*
- Red hand flares x 3*
- Buoyant smoke canister*
- Liferaft repair kit and set of three leak-stoppers*
- Torch with spare batteries and spare bulb*
- Heliograph (signaling mirror)*
- Spare drogue*
- Either a Radar Reflector OR an EPIRB*
- Sea sick bags/water collection bags*
- Whistle*
- Anti sea-sick tablets x 60*
- SOLAS First Aid Kit*
- Survival booklet*
- Signals recognition table*
- Relief valve (rubber) bungs*
- Jug/bailer*
- Bellows (air pump)*

The liferaft, deflated and folded, is stowed (with its internal equipment pack) as a self contained unit inside a sealed glass-reinforced plastic (GRP) container. Deployment of the raft is achieved by securing the painter line to a strong point on the vessel, throwing the packed raft into the water and pulling on the painter line until the operation of the firing head causes the raft to inflate and burst free from its container.

On a Coastal-surveyed fishing vessel, this operation can also be achieved automatically by a Hydrostatic Release Unit (HRU) which releases the raft as the vessel sinks. The raft container would then float free and the raft would be deployed as the vessel continued to sink and pull on the painter line. The buoyancy of the raft is far greater than the breaking strain of the painter line, causing the painter line to part thus ensuring the raft would not be dragged down, but would arrive safely at the surface as the vessel continued to sink. Total time to inflate the raft is 10-15 seconds at 12-21degrees Celsius.

Liferaft from F/V Mi Jay

Observations

1. Buoyancy chambers and inflation system

On inspection, both buoyancy chambers were found to be partially inflated with no sign of damage to either (Photo 1). The firing head was in the fully activated position, with the cylinder valve open, and subsequent weight checks proved the cylinder to be empty. This showed that the liferaft had been deployed and had inflated successfully on deployment. The subsequent loss of gas from the buoyancy chambers would be due to two main factors. Firstly, the arch tube had been severed relatively cleanly almost in its centre, (Photo 2) allowing gas to escape from the arch and then from the top buoyancy chamber via the non return transfer valve. Secondly the lower buoyancy top-up valve plug had become detached from its retaining cord and was lying in the bottom of the raft. This may have allowed gas to leak back through the top-up valve allowing the lower chamber to deflate gradually. (This process would have been very slow and adds weight to the liferaft having been afloat for some considerable time.) In addition to these two factors neither of the relief valves had been plugged, and the plugs were not in the raft, though they were recorded as present in the equipment pack at the raft's last survey (Appendix 1). All external life lines were intact, but the internal line had been severed in two places. Both lighting batteries were still attached to the raft body.



RFD Report Photograph 1



RFD Report Photograph 2

2. Floor

The floor of the raft was intact, with the exception of two holes which had been intentionally made to allow the raft to drain before being lifted on board when found. All the water ballast pockets and righting ladder were intact.(Photo 3)



RFD Report Photograph 3

3. Canopy

The canopy had been removed from the raft completely (Photo 4). The material appeared to have been cut initially for approximately half the canopy circumference, and then subsequently torn from the raft. This assumption was reached due to the canopy material still attached to the raft on one half, the other half had pulled off cleanly with the glued strip still in place on the canopy (Photo 5). The wires for the lights had been severed and both lights were missing.



RFD Report Photograph 4



RFD Report Photograph 5

4. Fitted Equipment

The drogue and rescue line and quoit were both missing. The ends of their respective lines were still attached to the raft. Both were secured to the raft when last surveyed, the drogue being secured to the painter patch, and the rescue line being secured to the internal life line adjacent the door.

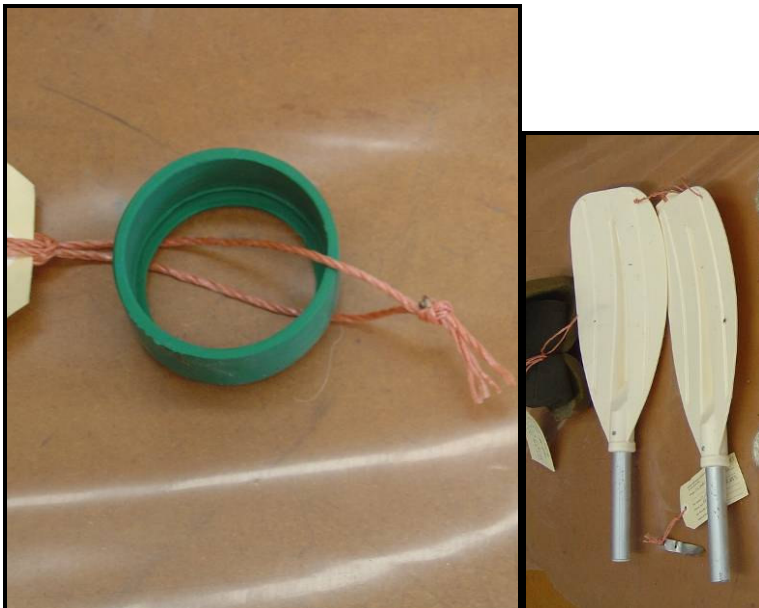
The blade of the safety knife would normally be riveted to the handle, but in this case, only the blade of the safety knife remained, the handle and retaining lanyard were missing. This and the shape of the blade led me to believe that the knife had been used extensively. (Photo 6)



RFD Report Photograph 6

5. Emergency Pack

The only items remaining from the equipment pack were the lens retaining ring from the torch (Photo 7), and the two paddles (Photo 8). There was no evidence of any other equipment or the emergency equipment bag itself.



RFD Report Photograph 7

6. *Painter Line*

The painter line on a Seasava plus liferaft is 10 metres long, with the operating head being attached approximately 1 metre from the painter patch at the raft end.

This last metre of line was still attached to the raft with the firing cable from the operating head attached to it. The line appeared to have been cut just beyond the firing cable. There was a length of similar line which had been coiled prior to the raft arriving at RFD Nelson. This was too long to be the remainder of the painter line and can only be the remnants of the drogue rode. There was also a 1200mm long piece of painter line with badly frayed ends which I am unable to speculate on.

Conclusions

- 7. The liferaft had been successfully deployed and had stayed afloat for some considerable time despite being severely damaged. It appears that the canopy had been deliberately removed and the arch tube severed by a relatively sharp object. The damage to the arch tube would have resulted in a large loss of gas from the upper buoyancy chamber, reducing the rafts freeboard, and reducing the amount of shelter offered by the buoyancy tubes. The rigidity of the raft would also have been compromised. The canopy is designed to provide a fully enclosed, sheltered environment in which survivors can shelter. Removal of the canopy would leave the rafts occupants open to the elements with all the associated risks. It also removes the main means of collecting rain water for drinking, as well as a large measure of security for both occupants and equipment.*
- 8. The drogue was missing from the raft and could have been severed by wreckage. The rode from the drogue was still present but not attached to the raft. I am unable to suggest what sequence of events led to this. The rescue line and quoit were also missing.*
- 9. The safety knife blade had become detached from the handle. As mentioned earlier, due to the appearance of the blade, I can only speculate that the knife had been used extensively and had broken due to the application of excessive cutting force. This suggests that the knife may have been used to cut the arch tube as well as the canopy.*
- 10. Most of the emergency equipment was missing. The equipment bag is tied securely to the raft during survey, and should remain so even when the liferaft is used, with equipment being removed from the bag, and then (if necessary) replaced and the bag re-tied. If this was not done, and with the liferaft canopy removed, the contents of the emergency pack would have quickly been lost overboard, especially in a rough sea. The presence of the torch lens retaining ring indicates that the occupants opened the emergency pack at some point.*
- 11. This raft equipment pack had a Davis Echomaster radar reflector fitted, but this too was absent assumed lost overboard. There was no EPIRB fitted in this liferaft.*
- 12. The end of the painter line was not heavily frayed like that of the drogue, suggesting that this had been cut by the occupants, as part of the prescribed raft deployment procedure.*

The author of the above report was unable to explain why the two crewmembers would have decided to remove the canopy to the liferaft or sever the arch tube. He could only surmise that this was done due to a lack of training, understanding and knowledge of the crew as to the design construction and operation of liferafts generally.

