

Accident Report

Grounding

Milford Mariner

18 September 2005

Class A





Photograph 1
Milford Mariner

REPORT NO.: 05 3843

VESSEL NAME: *MILFORD MARINER*

Ship Type:	Passenger
Certified Operating Limit:	Enclosed Milford Sound and Inshore Restricted Fiordland
Port of Registry:	Invercargill
Flag:	New Zealand
MSA No:	128010
Built:	2000
Construction Material:	Steel
Length Overall (m):	40
Maximum Breadth:	10
Gross Tonnage:	693
Net Tonnage:	265
Registered Owner:	Fiordland Travel Limited
Ship Operator/Manager:	Real Journeys
SSM Company:	Fiordland Travel Limited
Accident Investigator:	Domonic Venz

SUMMARY

On 18 September 2005 at 1230 hours, the **Milford Mariner** departed its berth for a 3-hour afternoon cruise of Milford Sound. Onboard were sixty passengers and ten crewmembers.

The vessel proceeded out to the entrance of the Sound and then started the return journey via various points of interest along the way. The Master supervised a Crewmember to steer the vessel for a time to gain some steering experience. The Master took over after about one hour and navigated the vessel past Sterling Falls and into Harrison Cove. The Master then set the vessel up on a straight course out of the cove and put another Crewmember on the helm to get some steering time. At this point the Chef was also in the wheelhouse. The Master asked the Chef to oversee the Crewmember on the helm while he went below to swap a fresh water valve over in the tank room. While the Master was gone, the Nature Guide called out on the ship's public address system that there was a penguin in the water. The Crewmember on the helm heard this and claims she reduced the revolutions of the main engines and engaged neutral on the gearbox controllers. At this point both main-engines stopped. The Crewmember and the Chef attempted to restart both engines. The gear boxes were both engaged in astern, stalling the main engines and creating difficulty in restarting. The Master ran back to the wheelhouse and tried to start the engines but was unable to do so before the vessel grounded. All passengers were checked and an internal inspection was made of the vessel. There was no ingress of water and the vessel returned to its berth in due course.

The report's conclusions state that a number of Active and Latent failures occurred from management through to the crewmember on the wheel at the time of the grounding.

The report makes a number of recommendations including Master and crew re-training; a review of propulsion systems; a review of start-up procedures and a review of general watch-keeping procedures.

NARRATIVE

Milford Mariner is a Fiordland inshore-restricted passenger vessel of 693 gross tonnes. She was built in Bluff and launched in 2000. She has a crew of ten who work a rostered seven days on, seven days off, during the summer season of September to May.

She is owned by Fiordland Travel Limited and operated by Real Journeys. They own and operate a fleet of eighteen vessels ranging in size from sixteen to forty metres.

She holds a valid Safe Ship Management Certificate issued by Fiordland Travel Ltd.

The ship has an overall length of 40.0 metres, a beam of 10.0 metres and a draft of 2.75 metres. Propulsive power is provided by way of two 373 kiloWatt Volvo main engines via two ZF BW 161 single speed gearboxes on a 3:1 reduction. The two propellers are four bladed, 1200-fixed pitch, 1.3 metres in diameter.

The Master holds a Skipper Coastal Fishing Boat Certificate (SCFB) of Competency, obtained in 1975. He also holds an Engineer Local Ship (ELS) Certificate of Competency, obtained in 1995. He holds a Pilot Exemption for Fiordland issued in 2005. He has worked for Fiordland Travel for eleven years as Master of various vessels within the fleet.

The crewmember holds an Advanced Deckhand (ADH) Certificate of Competency, obtained in October 2004. She has worked for Fiordland Travel for two and a half years on various vessels within the company.

The Chef holds an Advanced Deckhand (ADH) Certificate of Competency, obtained in January 2003. He has worked for Fiordland Travel for six years on various vessels within the company fleet.

THE ACCIDENT

At 1230 hours New Zealand Standard Time, on Sunday 18 September 2005, the passenger vessel **Milford Mariner** departed the berth in Fresh Water Basin, Milford Sound (*See Figure 3*).

Onboard were the Master, nine crew and sixty passengers.

The Master conned the vessel and passage was made towards Bowen Falls using the two main engines for propulsion only. After sightseeing at Bowen Falls the Skipper then hoisted the three main sails using the ship's remotely operated hydraulic winch system. The weather at this time was approximately 12 knots of east-southeast.

The vessel continued on towards the outer Sound and the Master navigated out past St. Anne Point (*See Figure 3*) where he encountered about 30 knots of wind.

At about 1300 hours the Master lowered the sails, turned the vessel in an arc to starboard and started the return sightseeing journey back towards the inner Milford Sound. He then supervised a junior crewmember while he steered the vessel into the Sound.

Passage continued with the crewmember conning the vessel. The Master took over the helm and stopped the vessel at Seal Rock to observe New Zealand Fur Seals basking on the rock.

After looking at the seals for a time the Master handed over the helm to a second crewmember who conned the vessel past Sterling Falls and on towards the underwater observatory.

Shortly before 1430 hours the Chef arrived in the wheelhouse for a break. At approximately 1430 hours, the Master took over the helm and berthed the vessel alongside the observatory, where four passengers disembarked the vessel.

The Master then headed in towards Harrison Cove (*See Figure 4*) to look for penguins. After spending some time looking he turned the vessel onto a broadly southerly course and increased revolutions to give about eight to ten knots speed. At this time he handed back the helm to the Crewmember. The Master then said to the Crewmember to "head for home". He asked the Chef to "keep an eye on her" as he was going to the tank room to swap a valve over.

At this point the vessel was between 150 and 200 metres off the shore to port and had just passed the mooring situated near the seventy-one-metre depth indicator in Harrison Cove.

The Crewmember on the wheel heard the nature guide on deck call out over the public address (PA) system that he had seen a penguin in the water. The Crewmember claims she then pulled the combined throttle/ gearbox controls back down to neutral. At this point both main engines stopped and the stall alarms sounded in the wheelhouse. Both gear boxes would have to have been engaged in astern for them to have stalled. The wind at this time was acting on the starboard side at about fifteen to twenty knots. The Chef immediately went to the helm station and attempted to restart both engines, but was unsuccessful. He tried a second time but to no avail. By this time the Master had returned to the wheelhouse and tried unsuccessfully three times to start the main engines using the controls at the centre console. By this time the vessel had started to sheer to port due to the wind acting directly on the starboard side. He then went to the port helm station and used the 'hot start' buttons to successfully start both main engines. He then pushed the power commander button, which activates the throttle/gear box levers. He did this and engaged full astern on both levers but got no response from the main engines or gearboxes. By this time the vessel had slowed to about four knots and was about twenty metres from the rock shore. The Master then made a call on the PA alerting the passengers and crew of the situation and instructing them to brace for grounding.

The vessel reared up on a rock and then settled onto an even keel (*See Figure 4*). As this was happening the Master shut down the main engines and restarted them using the centre console. He then engaged idle ahead to hold the vessel in place while the vessel and passengers were checked.

A search of the vessel revealed no ingress of water and no passenger injuries. The Master backed the vessel off the shore and returned to the berth arriving there at about 1515 hours.

After the passengers had disembarked a diver made a thorough examination of the hull. The Master and Management also carried out a thorough inspection of the internal hull.

COMMENT & ANALYSIS

Evidence

Maritime New Zealand commenced an investigation on the day of the accident. The Investigator interviewed the Chief Launch Master, Skipper, Chef and Crewmember on the helm at the time. Documentary evidence was obtained from Management in Te Anau. A site visit was conducted and further documentation was obtained from the vessel. Sea-trials were undertaken and various scenarios were re-enacted. A thorough inspection was made of the vessel and an assessment of the operation was made during a typical passage of the same type as that of the grounding.

Analysis

Manning

The vessel was correctly manned in accordance with **Maritime Rule Part 31B**. When plying within enclosed limits, the vessel was approved to carry 150 passengers. The manning requirement is listed in **Maritime Rule Part 31B, Advisory Circular**, as a Master holding Inshore Launch Master (ILM) Certificate, and one crew holding an Advanced Deckhand (ADH) Certificate. When plying the inshore-restricted limits, the vessel was approved to carry 64 passengers using the same manning as above. **Milford Mariner** has a single man bridge operation. The Maritime Rules do not require anyone other than the Master to be responsible for navigation and watch-keeping matters.

Training

Key grounding related personnel:

The Master completed 3 days of training for **Milford Mariner** starting 17 July 2003. This was an in-house Fiordland Travel Ltd training regime that was vessel specific but was applied to all vessels in the fleet. He was given clearance to operate the vessel on 21 July 2003. He had also attended training on Fiordland Travel's Safe Ship Management system in 1997. Masters are required to conduct onboard training of the crew. They are furnished with a document entitled 'Training document to be used by Launch Masters when training vessel crew'. This document refers to the crew training form used below.

The Crewmember on the helm at the time of grounding holds an Advanced Deckhands (ADH) Certificate. She had started training onboard **Milford Mariner** in August 2004. She had completed stage one which contained the following headings:

- Muster stations LSA
- Launching life raft
- SSM including hazard management
- Person overboard
- Grounding
- Abandon ship/EPIRB
- Collision
- Pyrotechnics
- FFA equipment and detection
- Fuel shut off
- Fans, vents and bulkhead doors
- Radio procedures
- Master incapacitation
- First aid.

She had partially completed stage two:

- Ships lines *
- Anchor operations
- Bilge and fire pumps
- Emergency steering
- Vessel handling *
- Watch keeping and anchor watch
- Basic electrical system
- Bilge alarms
- Sewage system

* Denotes not yet completed this heading.

She had also partially completed stage three and the miscellaneous sections:

- Crane operation
- Fuelling/ spill kits
- Computer operation*
- Water pumps and systems*
- Tender driving and daily, weekly checks*
- Sail operations and hazards*
- Radio procedures, SSB*

* Denotes not yet completed this heading.

Miscellaneous

- Steering certificate*
- Daily duties
- Risk management including kayak activity*
- Night stabi navigation*

* Denotes not yet completed this heading.

She had not been signed off by the Master as having clearance for this training during the 2004/ 2005 summer period.

Upon joining the vessel again for the 2005-2006 summer season, she was assessed against the crew training form by the Master. She had completed all of stage one with the exception of the Master incapacitation heading. She had completed stage two with the exception of ships lines, anchor operation, vessel handling and watch keeping/anchor watch headings. The only section completed in stage three was fuelling/ spill kits use and location. Under the miscellaneous section she completed daily duties only. At the time of the grounding she had yet to be given clearance by the Master.

Her last period of steering documented on the Real Journeys steering certificate, was 4 March 2005 consisting of 1½ hours. She was undergoing steering time immediately before the grounding. This was the first documented steering time this season. She had completed the ADH pre-requisite of 10 hours steering time on two other similar vessels within the Fiordland Travel fleet.

The Chef held an Advanced Deck Hand Certificate. He had also completed training onboard **Milford Mariner** in 2000. On 13 September 2005 he commenced training for the up-coming season. He completed all of stage one and stage two with the exception of the emergency steering, vessel handling and watch keeping / anchor watch headings. He had yet to complete stage three, tender driving and daily weekly checks and sail operations and hazard headings. He had yet to complete the miscellaneous section. The Chef stated that he had conned the vessel once in the last two seasons.

General Training

The Fiordland Travel, Safety Management Manual contains a crew training policy statement 3.5.5 (g):

The Master shall ensure that all crewmembers are suitably trained in safety and environmental matters, for the function they perform.

All crew have made available to them the **Milford Mariner** Crew Training Manual. This manual details topics ranging from guest bed making, tender operation through to injury prevention. It is used as a 'how to' guide onboard the vessel.

Masters are required to conduct onboard training of the crew; this is an on-going, hands-on based training program that is run throughout the season.

Before the summer season started, the Master conducted a week long training program for all crew onboard **Milford Mariner**.

This included simulated fire and man overboard drills as well as general safety related exercises in various departments onboard. There was familiarisation with the wheelhouse, but this did not go into detailed specifics regarding main engine start up and shut down procedures.

Environmental Conditions

During the afternoon of 18 September 2005, the speed of the wind was described as south-southeast (SSE) 30 knots while **Milford Mariner** was in the vicinity of the outer Milford Sound. The wind in the inner sound area near to where the grounding took place was SSE between 11 and 15 knots. Weather instruments recorded the maximum sustained wind gust in the inner Milford Sound as SSE 18 knots. After the vessel had exited Harrison Cove, due to the distortion of the wind direction and strength caused by the Sound, the wind was acting on the starboard side, causing leeway to port. Visibility was good throughout the afternoon.

Vessel Characteristics

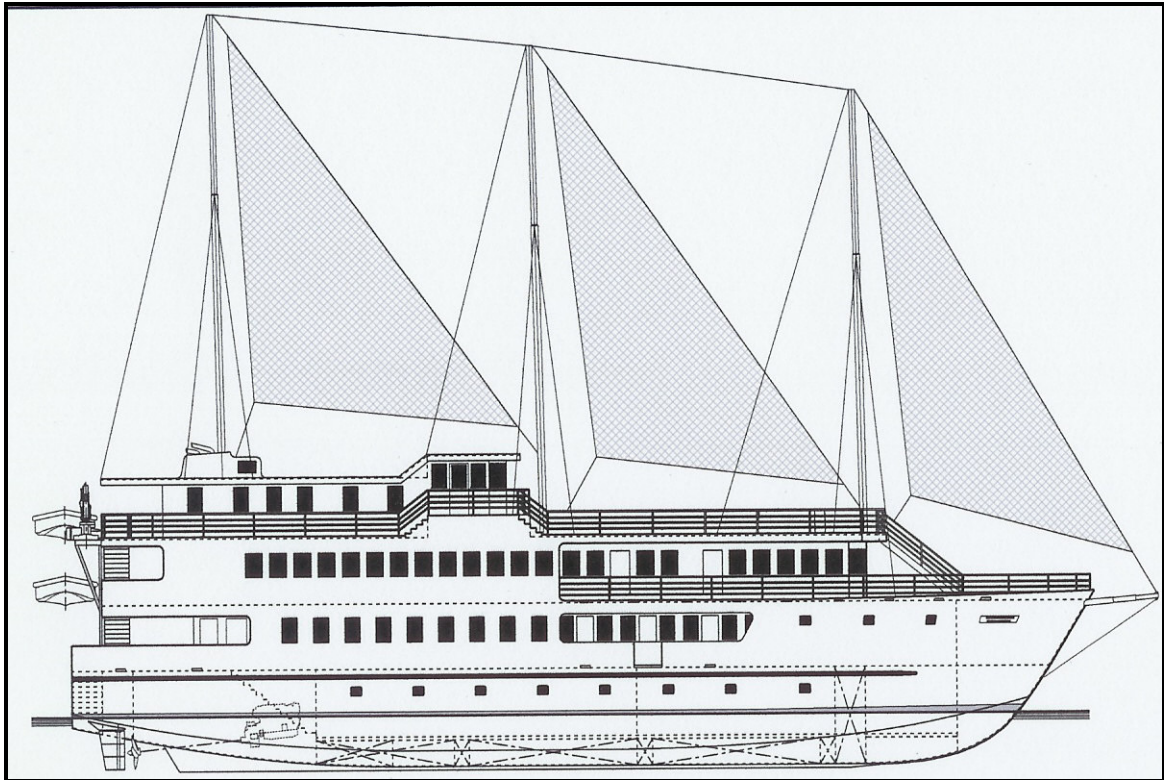


Figure 1

Milford Mariner

The vessel was built based on the design of an old trading scow. Due to the nature of this design, the vessel can experience leeway when stopped or at low speed. The height from the waterline to the deckhead of the bridge is 9½ metres.

The Crewmember states she pulled the throttle/gearbox levers back to neutral and the main engines stalled. This is not consistent with what has been experienced in the past with regard to main engine stall-outs. This vessel has stalled the main engines in the past, when astern is engaged at any speed over approximately 6 ½ knots. The main engines will recover at this speed if a short burst of higher revolutions is applied before returning to idle. This was tested by Maritime New Zealand at length and at no time did the main engine stall when astern was engaged at idle revolutions when the vessel was travelling at or below 6½ knots. Testing was unable to replicate a main engine stall when neutral was engaged while travelling at various speeds.

If the main engines stalled because astern was engaged while the vessel was travelling at about 8 to 10 knots, then the stern of the vessel would tend to weather cock and the bow would fall away to port due to windage at the time acting on the starboard bow. The combination of both the above would allow, if unchecked, a sheer to port.

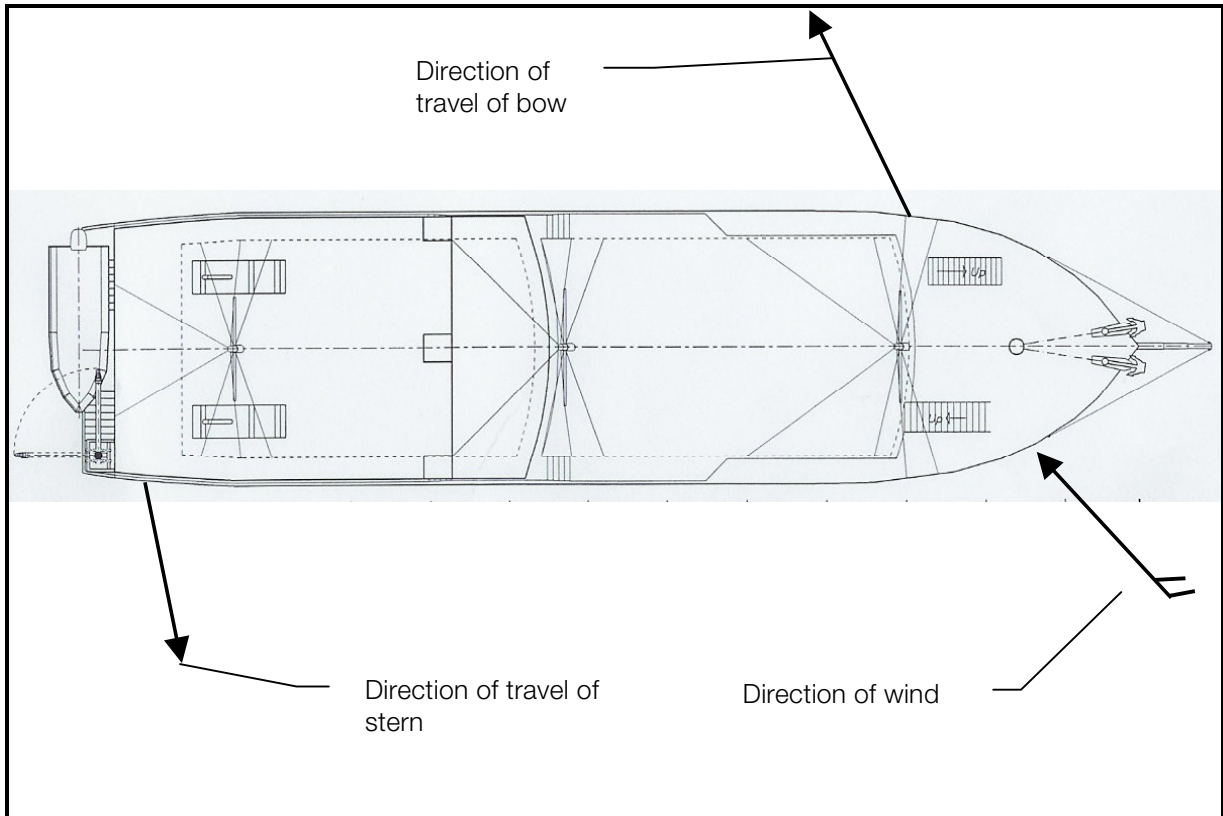


Figure 2
 Diagram of approximate movement of vessel after both main engines stall.

The above illustrates the effect the wind had on the stern when the main engines stalled. The wind was acting on the starboard side of the vessel; this caused the port bow to move to port as speed fell away after the stall.

Passage

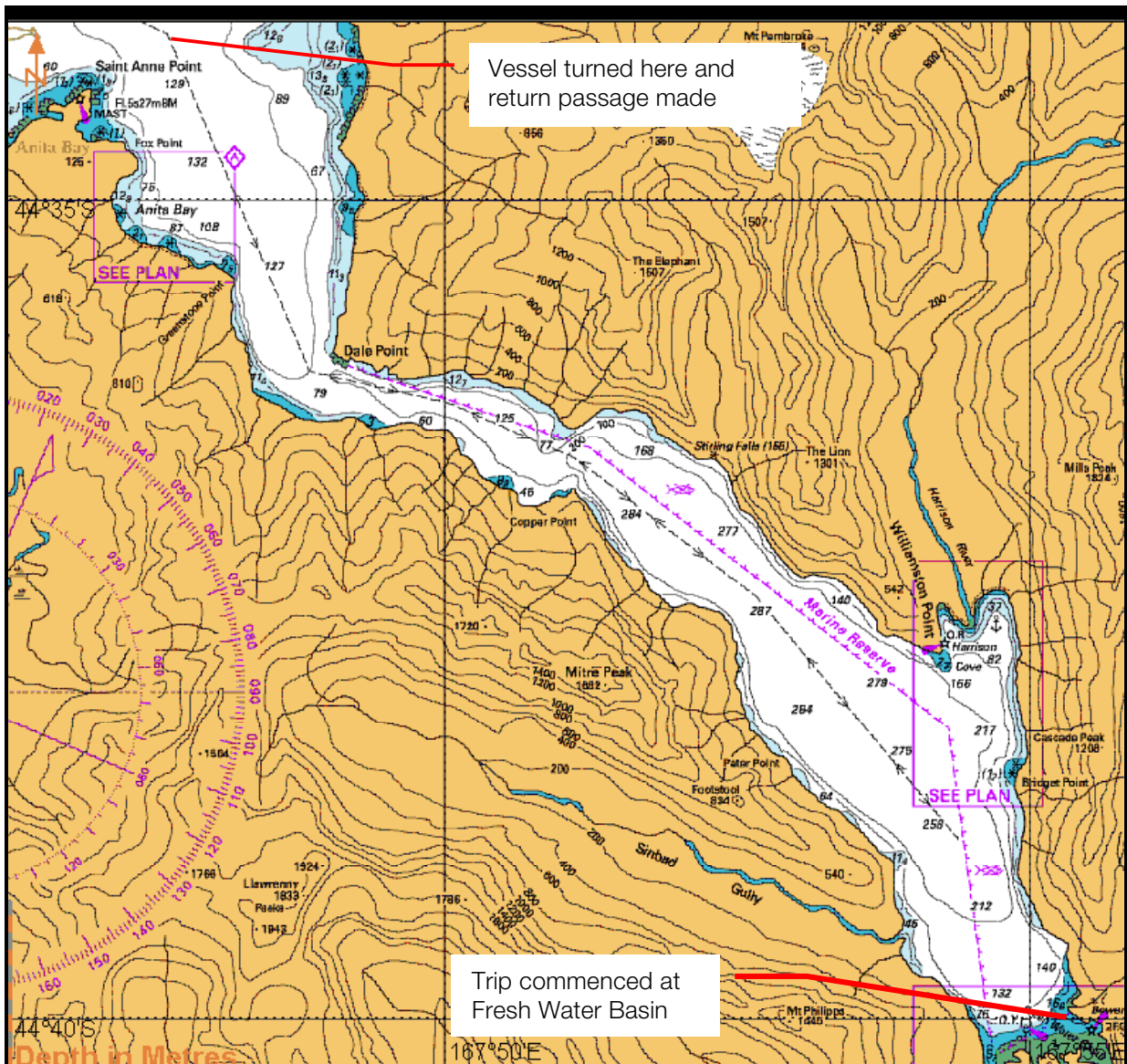


Figure 3
Milford Sound

The trip commenced at the berth in Fresh Water Basin, then passage made along the southern side of the Sound. The vessel stopped and looked at various points of interest along the way. The Master turned the vessel in the vicinity of St. Anne Point and headed along the northern side, back into the Sound, continuing the scenic cruise.

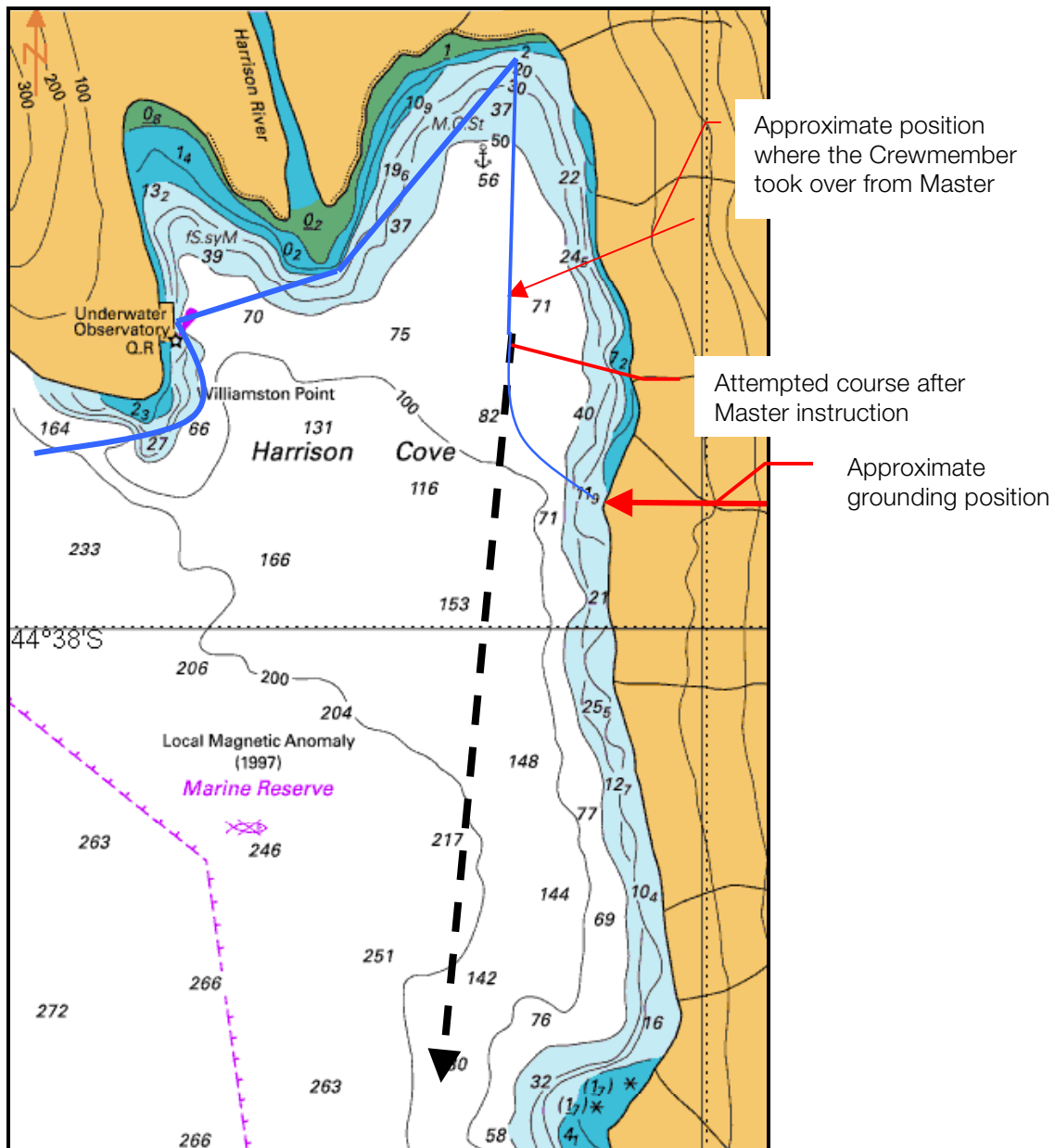


Figure 4
Harrison Cove

The vessel was approximately 150 to 200 metres off the shore when making passage back towards Fresh Water Basin.

Bridge Layout



Photograph 2

The view looking from the centre console towards the port control

The wheelhouse has three helm stations. The main console in the centre has the engine gauges and start keys. The starboard station has a helm and a power commander that operates the throttle/gearbox levers. The port station has a helm, a power commander and two 'hot start' buttons. These buttons can be used to bypass the four-stage start-up procedure if the engines have stalled when conning the vessel from the port station.

Start-up

Starting the main engines from the centre helm station essentially requires four stages:

- Turn ignition switches to the ON position
- Make sure throttle/gearbox levers are in neutral position
- Depress the button on the power commander unit
- Turn ignition key against the spring resistance to engage starter motor on main engine.

The above four steps must be completed for both port and starboard main engines. The power commander button needs only to be pushed once for both main engines.

If this procedure is not completed in this order then the main engines will not start.

If the operator has been unsuccessful in starting the main engines using the above steps then the ignition key must be brought back to the off position to reset the system before the next attempt at start-up.

When conning the vessel from the port station and the main engines stall they can be restarted using the following 4 stages:

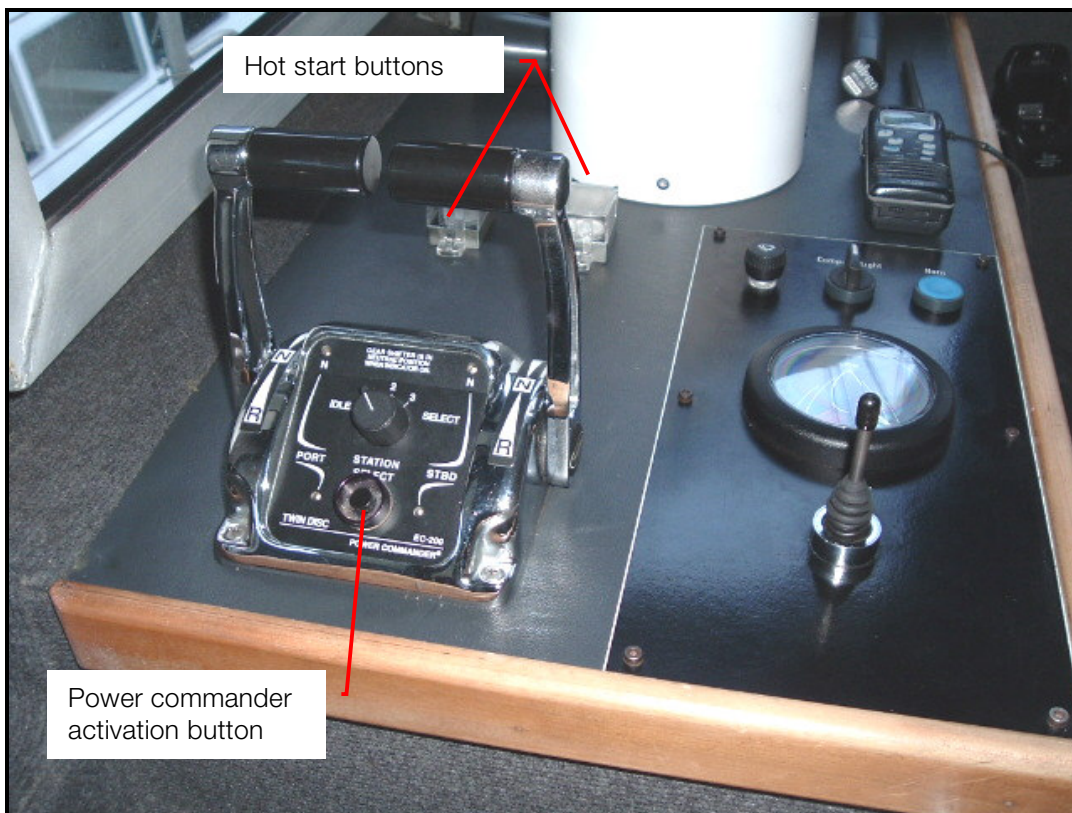
- The main console ignition switches must be in the ON position
- Make sure throttle/ gearbox levers are in neutral position
- Push the hot start buttons to start engines
- Depress power commander button to activate lever controls.

If the main console ignition switches are not in the ON position then the power commanders will not be operational.

The 'hot start' procedure allows the main engines to be restarted quickly when conning from the port station without needing to go back to the centre console. If the engine did stall when conning from the port station then the main ignition switches would already be in the ON position.



Photograph 3
Centre console engine control panel



Photograph 4
Port helm control station

Bridge Management

The Master had been supervising various Crewmembers as part of their on-going training at the centre helm throughout the trip. He had taken over the helm at certain areas where a more experienced helms-person was required.

After exiting Harrison Cove he asked the Crewmember to 'head for home'. He also said to the Chef who was taking a break in the wheelhouse to 'keep an eye on her' while he went below to turn the valve in the tank room. Both the Chef and the Crewmember would have been able to complete the valve change if instructed by the Master.

The Chef did not accept the responsibility, as he should have. He had received vessel-handling training, but was largely inexperienced due to Fiordland Travel employing him as a Chef.

The Nature Guide who was operating the PA on deck was not aware that the Master had left the bridge. The Crewmember on the wheel took it upon herself to make an adjustment to the vessel speed when she heard that there was a penguin in the water.

Company Management

Fiordland Travel has its own Safe Ship Management Company. They have a robust safety system that is well managed. They have an on-going crew-training regime in place for all crew. Nothing however is in place for the on-going training of masters.

This class of vessel has always been prone to stall when various conditions exist. There had been some investigations for a remedy undertaken by Management, but little had been achieved in the year leading up to the grounding.

Tankage

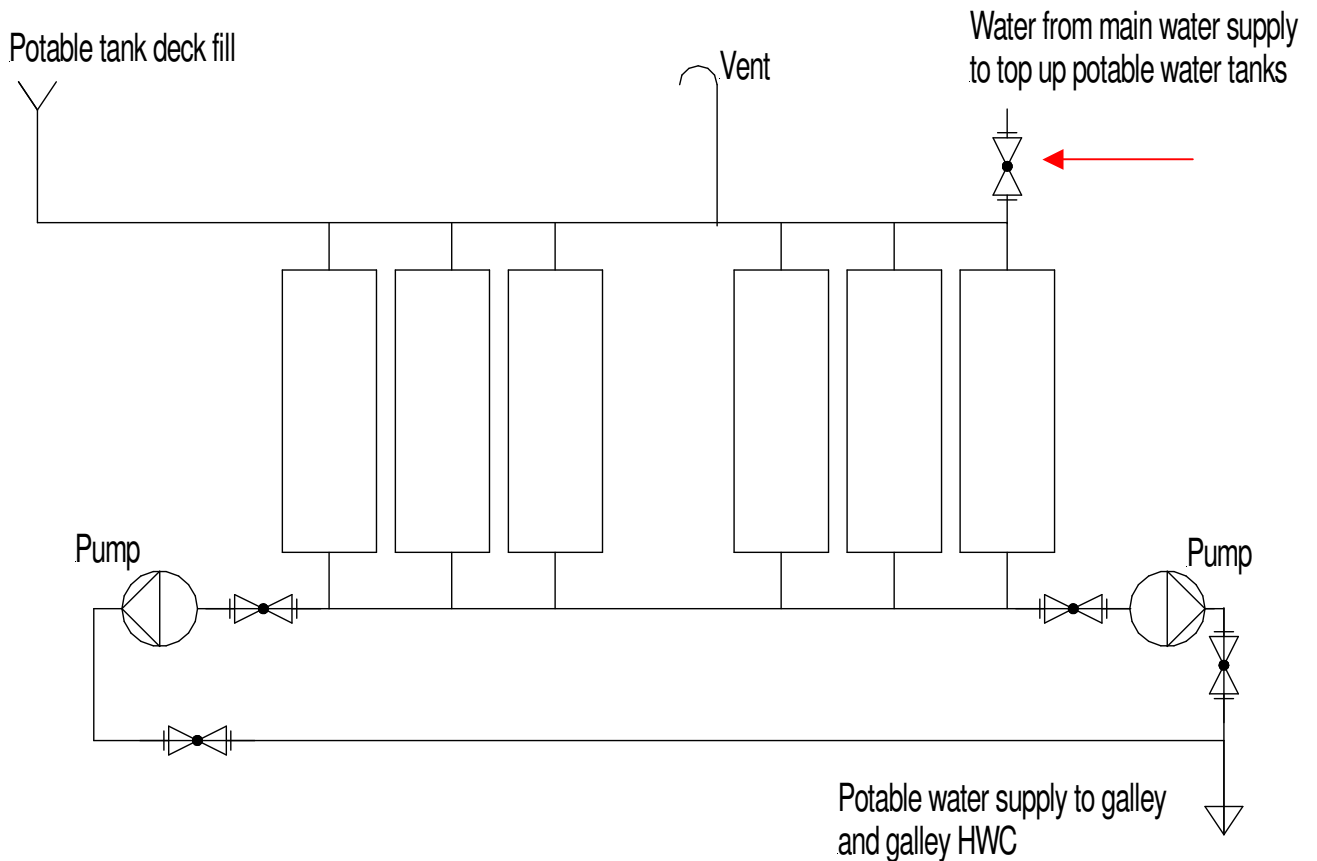


Figure 5

The above diagram illustrates the potable water system onboard *Milford Mariner*.

The red arrow indicates the valve that the Master went to turn. This was approximately 70 paces from the wheelhouse. He was transferring fresh water from the double bottom tanks to the six potable water tanks in the tank room. The valve was being adjusted so that the water would be transferred into all the tanks at an even rate, rather than one filling up at a time. The gauge on the potable tanks had failed sometime ago; this gauge could be monitored on a wheelhouse display. The Master wanted to transfer the water to the tanks so that after berthing he could simply fill the double bottom tanks using the shore supply. Both members of the crew who were in the wheelhouse could have adjusted this valve rather than the Master.

Main Engines

In July 1999 Fiordland Travel circulated a request for proposals to power *Milford Mariner*. Principal dimensions and vessel particulars were included in the documentation. Preliminary power and propeller calculations were included as supplied by the consulting engineers. During this phase the consulting engineers calculated the propeller dimensions based on the dimensions and power of the vessel. The

ship's particulars were sent to VEEM Engineering in Western Australia. They also calculated the best fit propeller and their results were very comparative to those of the consulting engineers. The Consulting Engineers note that the engines have adequate torque at the appropriate revolutions if the proper operational procedures are applied. Marine propulsion systems and specifically marine gearboxes are not designed to allow the very high levels of slippage that would be necessary to enable rapid full ahead to full astern changes. The 'burst of revolutions at present used to mitigate against a stall must be preceded by an interval in which the engine revolutions can fall to idle speed and the two clutches disengage and engage respectively.

Damage

The vessel sustained damage to two areas of contact below the water line on the port side. Both were aft of the forward watertight bulkhead between frames 10 and 11. They were located mid-way between the keel and the first chine. The worst effected area was 1 metre below the chine in frame 10 which was deformed approximately 100mm inwards and had caused the frame to lay over about 60 degrees from the hull plating.

The diver reported significant gouges and scraping over the area of impact.



Photograph 5
Impact area at frame 10



Photograph 6
Damage to frame 11

Testing

Maritime New Zealand accompanied the Chief Launch-Master and an alternate Master onboard ***Milford Mariner*** for testing and re-enactment of the pre grounding conditions. The vessel was between trips and no passengers were on board. The vessel was coned in a straight line and speed was progressively decreased from 8 knots during various runs. It was found that when the vessel was travelling at a speed above 6½ knots and astern was engaged on both engines, they would both stall; all watch-keeping crew and Management already knew this.

At the start of the testing, the Master was asked to stall both main engines and then restart quickly while he was watched. He failed to start both main engines. This was because he failed to follow the exact sequence required for start-up. This Master was very experienced in the operation of this class of vessel within the Fiordland Travel fleet.

A full examination of the throttle/ gearbox levers was undertaken by Maritime New Zealand. It was found that there were definite contact points, or 'clicks' when using the levers. A crew with less training and far less experience could possibly misinterpret the series of clicks heard and felt while moving the levers from ahead through neutral and then into astern.

Stall-out

The stalling is due to the large diameter propellers acting against the flow of water when the vessel is travelling above 6 ½ knots. All the Masters of this class of vessel make an allowance for this by applying a short burst of higher revolutions so that the main engine has enough torque available to stop and turn the propellers in the opposite direction.

The company had raised the idle speed of the main engines but was concerned what effect this would have on the gearboxes and transmission line. The General Manager of Maintenance and Supply for Fiordland Travel investigated some options almost exactly a year before the grounding. He emailed the suppliers of the gearboxes suggesting that they could look at increasing clutch engagement times. This would decrease the rapid torque demand and would allow the engine governors more time to respond to the load. The suppliers stated that this gearbox would not allow for this adjustment. They did suggest the fitting of a shaft brake that would activate when the bridge selected neutral, fitting a trolling valve and the fitting of a larger flywheel to the main engine to increase engine inertia. Both of the suggestions were considered to be cost prohibitive and had some technical difficulties to overcome.

Due to the make-up of the propellers, pitch cannot be removed from the blades. The Launch Master said that Fiordland Travel would investigate decreasing the propeller diameter when the vessel is next in dry dock.

CONCLUSIONS

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

A number of active and latent failures have been identified.

An **active failure** is an error made by the operational personnel. In this case this is the Master, Chef and the Crewmember. This error can have an immediate adverse effect.

A **latent failure** is the result of a decision or action made well before the accident and usually has been lying dormant for a long time. Such a failure is usually initiated by someone far removed from the event in both time and space, who is the decision maker in the line management. The failure can then be introduced at any time into the system by the human element.

Active Failures

- The Master left the bridge to change a valve that could have been changed by another Crewmember.
- The Master did not impart clear instructions to either the Crewmember on the helm or the Chef.
- He asked the Chef to 'keep an eye on her' while he was out of the bridge. He told the Crewmember to 'head for home'.
- The Chef accepted this responsibility without thinking through the risks involved.
- The Crewmember on the wheel decided to stop the vessel when she heard over the PA that a penguin had been sighted.
- The Chef and Master were unable to start the main engines from the centre console.

Latent Failures

- The Chef and Crewmember had been trained; but this training did not cover in any depth the stall/ start-up procedures. The week training given to all crew at the start of the season was focused on emergency preparedness as instructed by management.
- No on-going training procedures were in place for Fiordland Travel Masters. Bridge Resource Management (BRM) training is not part of this Master's maritime qualification. Fiordland Travel does not have any BRM training regime in place at this time. Fiordland Travel does train Skippers further when they transfer between vessels or advance within the company.
- Fiordland Travel does not have procedures in place regarding the Master leaving the bridge for any reason. This should cover notification of the Nature Guide, letting them know that the Master is not on the bridge.
- Section 4.2.19 (1) Navigational Watch Keeping contained in the Fiordland Travel Safe Ship Management Manual states: - *The Master is responsible for the selection of competent, watch-keeping crew and the enforcement of these standards.*
- Section (3) states: - *The Master should at a general meeting, instruct the crew as to the watch standards expected aboard ship.*
- The section has a note at the start which states: - *This section relates to multi-day vessels and coastal delivery voyages, however it should be noted that any personnel involved with watch keeping are required to be familiar with, and maintain these standards while underway.*
- The Master and Company failed to implement these standards.

- The gauge that monitors the potable water tank level had failed some time ago. The tanks then had to be monitored manually. The Company had initiated steps to correct the problem after the issue was raised.
- The start-up procedure requires a number of steps to be followed precisely in order for the main engines to start. In a stressful situation, like that one that the Chef and Master found themselves in as the vessel drifted towards the beach, the start-up can and was overly complicated. Fiordland Travel has amended the stall procedures but they stop short of trying to simplify the system.
- Fiordland Travel has investigated various ideas regarding the stall issue. This includes gearbox changes, shaft brakes, propeller alterations and increasing the main engine idle revolutions. As yet they have not implemented any of these ideas. Minimal crew training has been given to mitigate against this as noted above.
- The main engines have been de-rated to give 373 kW at 1600 revolutions per minute. The workshop new un-de-rated engine will give 404kW at 1800 rpm.
- The vessel was travelling at 8 knots within 200 metres of the shore. This contravenes the Environment Southland, Navigation Bylaws: -

Southland Navigation Bylaws

3.0 OPERATING REQUIREMENTS

3.2 SPEED OF VESSELS

3.2.1 No person may, without reasonable excuse, propel or navigate a vessel (including a vessel towing a person or an object) at a proper speed exceeding 5 knots:

(a) within 50 metres of any other vessel, raft, or person in the water; or

(b) within 200 metres of the shore or of any structure; or

(c) within 200 metres of any vessel or raft that is flying Flag A of the International Code of Signals (divers flag).

- Had the vessel been travelling in a position more than 200 metres from shore, then in the event of an emergency then the Master would have had more time to remedy a problem. This is particularly crucial when a crewmember is on the helm gaining steering time and the Master is not on the bridge.
- The vessel was manned in accordance with **Maritime Rule Part 31B**. This rule does not specify that anyone other than the Master need be responsible for navigation and watch keeping. From time to time the Master did have crew on the bridge for training purposes. This grounding may have highlighted the need for one crewmember to be specifically on call in case the Master has to leave the bridge for any reason. This would allow the vessel operations to continue as normal under the control of a qualified, well-trained crewmember.
- The Master held a Skipper Coastal Fishing Boat (SCFB) Certificate. This is listed in **Maritime Rule Part 31B.5** as an equivalent certificate to the ILM that is required. While this Certificate is listed as a suitable equivalent, there are areas where the training is less than ideal. The syllabus of SCFB did not have any bridge resource management as a learning requirement. This Certificate was discontinued in 1986.
- The syllabus of the ILM Certificate, which is the required manning for this vessel, contains some reference to watch-keeping practises and minor bridge resource management issues.
- Any Masters holding ILM and SCFB should have been identified by Maritime New Zealand, and Fiordland Travel as having less than ideal training for operating large vessels carrying up to 200 passengers.

Root Causes

- The main engines stalled through misuse. The Crewmember claims she did not engage astern; this is not supported by technical evidence or by the testing completed by Maritime New Zealand.
- The main engine start-up procedure was overly complicated. The Chef and Master could not start the engines in a time or urgency. When undergoing testing, the alternate Master was unable to start the main engines when pushed to do so by the Investigator.

SAFETY RECOMMENDATIONS

1. That all Fiordland Travel Masters are trained in Bridge Resource Management techniques to an appropriate level.
2. That any crew that are signed off to navigate are properly trained with regard to main engine emergency start-up. This should be a major part of the pre-season training.
3. That Fiordland Travel undertakes a risk assessment of its operating procedures, with particular regard to navigation and watch-keeping techniques to be employed when operating within the restricted waters of Milford and other Sounds.
4. That Fiordland Travel simplifies and documents the potable water system to ensure it does not require major input from the Master or crew.
5. Fiordland Travel seeks independent input from suitably qualified technicians regarding the modification and simplification of the main engine start-up. This to be carried out on the centre console as well as the port side 'hot start' system.
6. That Fiordland Travel seeks input from independent suitably qualified technicians regarding a review of the main engine stall problem. The review should cover but should not be limited to, the suitability of the propeller design and size, main engine kW output and de-rating, gearbox type and shaft braking.
7. That Fiordland Travel complies with or seeks exemption to the Environment Southland Navigation Bylaws regarding speed within 200 metres of shore.
8. That Fiordland Travel documents that when training crew on steering, the Master should always personally supervise them, and should never leave the bridge under these circumstances.
9. That the Director of Maritime New Zealand censures the Master for his failure to ensure the safe navigation of the vessel.
10. That Maritime New Zealand critically reviews the suitability of the Maritime Rules pertaining to Master qualifications for large vessels with high passenger numbers that operate within the inshore and enclosed areas. This should include but not be limited to the differing handling characteristics of various vessels. MNZ has recognised this with regard to the high speed endorsement.
11. That Maritime New Zealand conducts a thorough trend analysis of accidents involving restricted limits passenger vessels that carry large numbers of passengers. The scope to cover, but not be limited to, the appropriateness of the Masters qualifications.

Note:

Recommendations 3 through 8 above, to be implemented within 2 months of the final report being published. Recommendations 1 and 2 above, to be implemented before the start of the 2006/2007 season.

ACTION TAKEN

Fiordland Travel Ltd has made a number of procedural changes. These include:

- Writing a stall procedure for this class of vessel.
- All watchkeeping crew to be fully trained in restarting stalled engines. This to come under the 'vessel handling' section of crew training forms
- Any trainee crew on the helm should be under the direct supervision of the Master
- Masters to let the nature guide know if he is leaving the bridge.
- Procedures required for valve changeover which can be delegated to crew, should be.
- A company memo was issued on 13 October 2005 to the Masters of **Milford Mariner**, **Navigator** and **Wanderer** highlighting the above issues.
- Fiordland Travel has placed on their records, a verbal warning to both the Master and Crewmember on the helm. They have also censured the Chef for accepting the responsibility of supervising the Crewmember too lightly.
- Fiordland Travel's General Manager of Maintenance has recommended that they remove the separate potable water system and that they revert to the original double bottom water tanks.