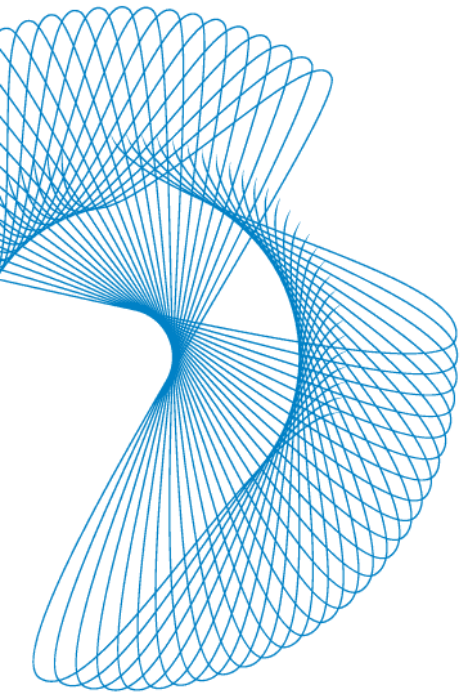
MARITIME NEW ZEALAND



Investigation Report

Collision between ***Waitohi*** and ***Atua***

26 October 2011

Maritime New Zealand

Maritime New Zealand (MNZ) is a Crown Entity appointed under section 429 of the Maritime Transport Act 1994, with the responsibility to promote maritime safety, security and the protection of the marine environment.

Section 431 of the Maritime Transport Act sets out MNZ's functions. One of those functions is to investigate and review maritime transport accidents and incidents.

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Glossary

CLM	Commercial Launchmaster
DOC	Department of Conservation
GPS	global positioning system
hp	horsepower
HSEA	Health and Safety in Employment Act 1992
ILM	Inshore Launchmaster
knots	nautical miles per hour
LLO	Local Launch Operator
MDC	Marlborough District Council
MNZ	Maritime New Zealand
MTA	Maritime Transport Act 1994
OOW	officer of the watch
Part 22	Maritime Rules Part 22
SOP	safe operational plan
SSM	safe ship management
STCW	Standards for Training, Certification and Watchkeeping
TAIC	Transport Accident Investigation Commission
VHF	very high frequency

Executive summary

On 26 October 2011 at approximately 1000 hours, the commercial vessel ***Waitohi*** and the recreational yacht ***Atua*** collided near Bull Head in Queen Charlotte Sound.

Atua was returning to Waikawa Bay from Resolution Bay in Queen Charlotte Sound. ***Waitohi***, a vessel owned by the Department of Conservation (DOC), was heading out for a day's work on walking tracks in the Sound.

Waitohi was travelling at about 20 knots (10.2 metres per second, or m/s) and ***Atua*** was travelling under a reefed head sail and main engine at about 4 knots (2.0 m/s) in the opposite direction. Witnesses state that ***Waitohi*** veered to port and collided with ***Atua*** at a right angle.

The skipper of ***Waitohi*** sustained minor head injuries during the collision and does not recall the events leading up to and including the impact. The skipper/owner of ***Atua*** did not sustain any injuries.

Atua was a total loss, but was salvaged because its rigging remained attached to ***Waitohi*** after the collision. ***Waitohi*** sustained cracking and dents to both bows and some warping to the transom.

As a result of Maritime New Zealand's investigation, a number of recommendations have been identified. The recommendations are for the Department of Conservation (DOC) to update and make changes to the following vessel operational systems to better adhere to existing requirements and systems:

a) regular monitoring and documentation of skippers operating vessels over 6 metres in length

b) single-man operational areas for risk analysis and lanyard use

c) use of all navigational aids

d) routine internal auditing of the SSM system.

e) MNZ liaison advisor works with DOC to ensure these changes are embedded nationally.

Factual information

1. The information used to compile this report was obtained from several sources, including the skippers of the vessels involved, DOC, Marlborough District Council (MDC) and Maritime New Zealand (MNZ).

Vessels

2. DOC owns 97 vessels, which it uses for different functions around New Zealand. The vessels range from 2.6 to 22 metres. The department has seven vessels based in Havelock and Picton.

Figure 1 ***Waitohi***

MNZ

3. ***Waitohi*** is an 8.5 metre catamaran powered by twin 175 hp Honda outboards. This vessel is based out of DOC's Picton office, while its sister ship ***Waiata*** is based out of the Havelock office.

4. The vessel is fitted with a Furuno Chart-plotter global positioning system (GPS), radar and echo sounder. Its normal operating speed is 20 knots. At the time of the collision, the vessel had a valid SSM certificate.

Figure 2 ***Atua***

DOC

5. ***Atua*** is a 28 foot Herreshoff-designed rigged sloop and was built in 1963. The vessel was powered by a 15 hp Yamaha outboard with a top speed of about 5½ knots. The vessel was fitted with a hand-held GPS and VHF radio.

Key personnel

6. ***Waitohi*** was skippered by a DOC employee who held a commercial launch master's (CLM) certificate of competency, issued in 1987.

7. ***Atua***'s skipper, who lives on board the vessel, also held a CLM certificate of competency.

Narrative

8. On the morning of 26 October 2011, ***Waitohi*** departed Picton to carry out a routine planned explosives operation for track maintenance at Resolution Bay in Queen Charlotte Sound. The vessel was carrying 70 sticks of Power-Gel explosive and, separately, associated detonator cord. This was all in accordance with the DOC safe operational plan (SOP) for safe handling of explosives.

9. ***Waitohi***'s skipper was the vessel's sole occupant. After clearing the inner harbour at about 0930 hours, he increased speed until the vessel was travelling at about 20 knots.

10. As the vessel made its way in a broadly northerly direction, wind-borne spray was landing on the forward windows. The skipper was operating the wipers intermittently, but witnesses described the visibility as good.

11. ***Waitohi*** cleared the Luke Rock area and was on a parallel course with the passenger vessel ***Tiri Cat***, which was travelling at about the same speed. The skipper of this vessel was a witness to the collision and able to provide a statement to MNZ.

12. The same morning, the skipper/owner of the recreational yacht ***Atua*** departed School House Bay, bound for Waikawa Bay. He was travelling under a close reefed jib and engine and was making about 3–4 knots.

13. ***Atua***'s skipper observed ***Waitohi*** ahead, travelling well to port of his intended track. There appeared to him to be ample safe passing distance on their reciprocal courses.

14. The skipper of ***Atua*** states that as ***Waitohi*** came almost abeam (at an approximate distance of 50–80 metres), he saw it veer sharply to port and head directly for his vessel. He said he could not see anyone in the wheelhouse and only had time to engage full astern. He was then thrown overboard as ***Waitohi*** struck amidships and rode up onto the cabin top.

15. ***Atua***'s skipper surfaced alongside the port side of his yacht and saw above him the two outboard engine propellers, still turning at what appeared to be full ahead, well clear of the surface of the water.

16. The skipper of ***Tiri Cat*** had observed the collision and steamed to the wreckage to render assistance. He recovered ***Atua***'s skipper from the water and looked to see if anyone was hurt on board ***Waitohi***.

17. At this time, ***Atua*** was sinking, but was held up by its rigging, which was caught on the bow area of ***Waitohi***. The skipper of ***Waitohi*** came out of the cabin in a very confused state and asked what had happened and whether anybody was hurt. Witnesses said he appeared to have no recollection of what had happened and had a gash to his forehead, which was bleeding.

18. After checking that his vessel was okay, ***Waitohi***'s skipper was transferred to ***Tiri Cat***, where he received medical attention. Shortly after this, he was transferred to another, faster vessel and taken to Picton for medical treatment.

19. The Police, Coastguard, DOC and harbourmaster all attended the scene and both vessels were towed to a sheltered bay, where ***Atua*** was lifted onto a barge and returned to Picton. DOC staff then took ***Waitohi*** to Picton under its own power, where it was removed from the water for assessment.

Analysis

Geographic area

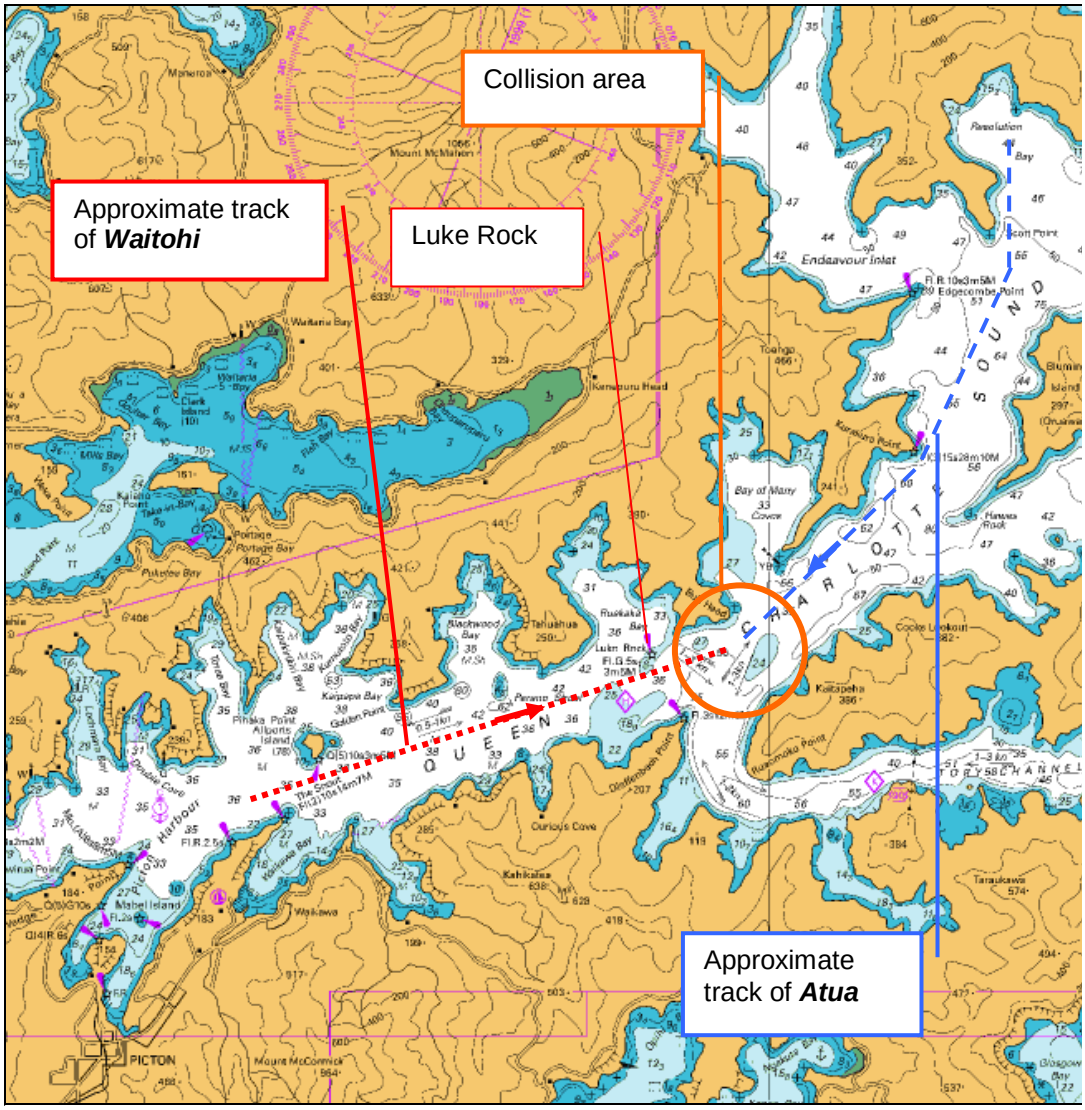

Figure 3 Chart of overall area

MNZ

20. Both vessels were in sight of each other for some time prior to the collision. The skipper of ***Atua*** said he had seen ***Waitohi*** and was unconcerned about the vessels' respective courses.

Navigation aids

21. ***Waitohi*** was fitted with a Furuno Chart-plotter GPS, which was turned on at the time of the collision. This unit was analysed by the manufacturer, but detailed analysis was unable to be completed because it is a baseline model. The track recalled from the memory of the unit was unable to show sufficient detail to determine the timing and final veer to port.

22. The vessel is fitted with radar, but it was not activated.

Environmental conditions

23. The weather at the time of the collision was described as heavily overcast with a low cloud base. However, the visibility at sea level was good. The wind was from the forecast north-westerly direction and was reportedly gusting between 20 and 40 knots at times. Waves were described as between 1 and 1.5 metres, with occasional white caps.

24. As ***Waitohi*** made its way along its course, wind-blown spray was occasionally thrown onto the forward and port side windows. This was caused by the port hull catching the wind chop, which was broad on the port side, and necessitated the intermittent use of the windscreen wipers.

25. The weather conditions were within the safe operating limits set out in DOC operational guidelines. In keeping with the vessel's catamaran design, the skipper said it was occasionally dropping the windward (port) hull into the wave troughs.

26. Witnesses state that the wind was blustery at times and, as commonly occurs in the Marlborough Sounds, was blowing from various directions within a broadly westerly quadrant.

Medical / injuries

27. The skipper of ***Waitohi*** sustained mild concussion and a cut to his forehead after striking the GPS unit. He was hospitalised for the night and discharged.

28. He has undergone a barrage of medical tests since the collision and doctors have stated in the latest medical report:

> *… it is much more likely that he was knocked unconscious as a consequence of the crash, rather than causing the crash himself.*

29. Shortly after the collision, DOC stood the skipper down from hazardous duties, including driving vessels and vehicles. Maritime New Zealand also suspended his CLM until satisfied that he was medically fit.

Mechanical

30. The steering consists of a hydraulic pump operated by turning the helm. This, in turn, activates a ram at the outboard, pushing it either way. The steering was found to be operating satisfactorily on the return journey to Picton. An oil leak at the helm position was considered not to have been present before the impact and it is assumed to have occurred as part of the collision, when the skipper struck the wheel.

31. The manufacturer's specification noted that the steering unit on the vessel was capable of taking single or twin engines up to 400 hp. This vessel had a total of 350 hp with twin outboards.

32. The agent checked the engines after the collision and found them to be in good working order. They were used satisfactorily to bring the vessel back to port immediately after the collision.

33. The vessel was fitted with a combine throttle/ gear box lever. Attached to the rear of this in the helm position was a cut off lanyard. A cut off lanyard immediately shuts the engines down when the clip attached to the lanyard is removed from the levers. The Skipper on board ***Waitohi*** did not have this attached at the time of the collision.

Navigational situation

34. Maritime Rules Part 22 (Collision Prevention) applies to all vessels navigating in New Zealand waters. Because the incident involved a New Zealand ship and was within the New Zealand territorial sea, Part 22 applied at the time of the incident.

35. The vessels were on a near-reciprocal head-on course, but there was no risk of collision. Maritime rules state that if the vessels *are* on a reciprocal course and a risk of collision exists, then each vessel must alter to starboard and pass port to port.

36. The skipper of ***Tiri Cat*** said he thought that in the minutes leading up to the collision, ***Waitohi*** made an alteration to starboard, but from his vantage point he cannot be certain. This could indicate that the skipper was aware of the approaching yacht. The skipper of ***Waitohi*** does not recall this.

37. ***Atua***'s skipper said he made an alteration to starboard after initially sighting the approaching ***Waitohi***.

38. The skippers of ***Tiri Cat*** and ***Atua*** both state that ***Waitohi*** then made a sharp turn to port and headed straight towards the yacht.

DOC skipper training

39. DOC has MNZ approval to operate its own training system under Maritime Rule Part 35.10. However, in this case the approval is irrelevant because ***Waitohi***'s skipper has a CLM certificate (issued on 24 April 1987) and is fully qualified in terms of what is required by law.

DOC operating systems

40. All work with vessels in the Sounds Area is covered by the DOC operating system, Safety Plan 5048, Sounds Vessel Operation. This document is essentially a hazard register, and as such DOC has an effective method for the identification and treatment of hazards.

41. Single-person operations are not listed as a hazard, although Safety Plan 5048 does specify when single-person operations are considered appropriate.

42. The DOC Sounds Area Vessel Operations Code of Practice provides more detailed background systems and procedures to support the Safety Plan, developed in 2007 and last reviewed in July 2010, it promotes and ensures the safe and professional use of all departmental boats operating within the Sounds Area.

43. The code of practice notes that a second person is required on board if a vessel leaves the confines of the Marlborough Sounds. At the time of the collision, the vessel was operating well within those confines.

44. The vessel has an SSM manual as part of its SSM approval. Listed under section 7.1 and underlined is the following:

> *Refresher training will be conducted at not greater than six monthly intervals to ensure the ongoing competency of crewmembers including the Master.*

45. There is no formal evidence that this refresher training has taken place and the skipper of ***Waitohi*** does not recall it having occurred. This amounts to a failure to comply with the Maritime Rules, because the requirements of the SSM manual have not been followed. However, it is accepted by MNZ that there was some training in place for skippers, although neither formalised nor well documented.

46. Occasional Spot Programme Hazard Management Audits have been conducted. However, these appear to have been ad hoc and do not meet the requirements of DOC's own procedures. This is another example of non-compliance with the Maritime Rules.

Best practice navigation and watchkeeping

47. The following is an extract about navigation principles from the *Bridge Procedures Guide*. This guide was written by the International Chamber of Shipping to bring together the good practice of seafarers, with the aim of improving navigational safety and protecting the environment:

> ***Monitoring the progress of the ship***
>
> *Good navigational practice demands that the Officer of the Watch (OOW):*
>
> - *understands the capabilities and limitations of the navigational aids and systems being used and continually monitors their performance*
> - *uses the echo sounder to monitor the changes in water depth*
> - *uses dead reckoning techniques to check position fixes*
> - *cross-checks position fixes using independent sources of information. This is particularly important when electronic fixing systems, such as GPS, are used as the primary means of fixing the position of the ship*
> - *uses visual navigational aids to support electronic position fixing methods, that is, landmarks in coastal areas*
> - *does not become over reliant on automated navigational equipment, including electronic chart systems, thereby failing to make proper navigational use of visual information.*
>
> *Over-reliance on automatic systems, coupled with the officer of the watch paying too little attention to visual navigational and watchkeeping techniques, can be dangerous.*

48. Although the *Bridge Procedures Guide* has been developed for use in larger vessels, the basic principles of safe navigation apply to all vessels at sea. While the guide does not impose legal obligations, MNZ recommends that masters and skippers of small vessels adhere to its principles, to ensure the safety of their vessel and those on board.

49. New Zealand has developed its own guidelines for watchkeeping practices. The following are extracts from the advisory circular for Maritime Rules Part 31B (Crewing and Watchkeeping Offshore, Coastal and Restricted (Non-Fishing Vessels)):

> *Rule 31B.18 requires the owner and the master of a vessel to establish and implement watchkeeping procedures, and the crew to comply with those procedures. The following guidelines are copied from the STCW requirements for Part 31A vessels and the wording adapted slightly to make them more applicable to smaller vessels. Owners, masters, and crew of smaller vessels should focus on those underlying principles and further adapt the detail as necessary for their own vessels, including interpreting terms such as "officer", "bridge", etc., as appropriate to their own vessel.*
>
> *A proper look-out must be maintained at all times in accordance with rule 22.5 and should serve the purpose of-*
>
> *(a) maintaining a continuous state of vigilance by sight and hearing, as well as by all other available means, with regard to any significant change in the operating environment; and*
>
> *(b) fully appraising the situation and the risk of collision, stranding and other dangers to navigation; and*
>
> *(c) detecting vessels or aircraft in distress, shipwrecked persons, wrecks, debris and other hazards to safe navigation.*

The officer in charge of the navigational watch should, during the watch, check the course steered, position and speed at sufficiently frequent intervals, using any available navigational aids necessary, to ensure that the vessel follows the planned course.

The officer in charge of the navigational watch should be thoroughly familiar with the use of all electronic navigational aids carried, including their capabilities and limitations, and should use each of these aids when appropriate and should bear in mind that the echo-sounder is a valuable navigational aid.

The officer in charge of the navigational watch should use the radar whenever restricted visibility is encountered or expected, and at all times in congested waters, having due regard to its limitations.

The officer in charge of the navigational watch should ensure that range scales employed are changed at sufficiently frequent intervals that echoes are detected as early as possible. It should be borne in mind that small or poor echoes may escape detection.

Whenever radar is in use, the officer in charge of the navigational watch should select an appropriate range scale and observe the display carefully, and should ensure that plotting or systematic analysis is commenced in ample time for the safety navigation of the vessel.

50. As noted above, there are a number of rules and best practice guidelines surrounding the development and implementation of good watchkeeping practices on board vessels at sea. DOC systems do not routinely go into this detail and instead leave the safe navigational practices to be decided by the skipper on the day. There is no evidence that these rules and guidelines were not followed in this case.

Audits and inspections

Safe Ship Management

51. As a recreational vessel, ***Atua*** was not required to hold an SSM certificate or any other type of safety certification.

52. ***Waitohi*** held a valid SSM certificate at the time of the collision.

53. ***Waitohi*** was last inspected by Maritime New Zealand on 21 July 2009. Two deficiencies were noted:

    a) inflatable lifejackets to service

    b) radio survey to complete.

54. The vessel was inspected by its SSM Company on 9 June 2009, with nil deficiencies noted.

Findings

55. At the time of the collision, ***Waitohi*** was travelling at about 20 knots and ***Atua*** was travelling at about 4 knots. Moments before the collision, they were on nearly reciprocal courses and safely passing. The ***Waitohi*** suddenly veered to port and struck ***Atua*** amidships.

56. There are a number of possible explanations for the collision. The hull of ***Waitohi*** may have broached on a wave, causing a sudden lurch to port. This may have caused the skipper to be knocked over, hitting his head on the chart-plotter and buckling the steering wheel. However there is insufficient evidence to form a definite conclusion about the cause of the accident.

57. The ***Waitohi*** skipper has undergone a full medical evaluation, and the doctor has ruled out a medical event as the cause of the ***Waitohi*** skipper's injury. Therefore a medical event could not have caused the vessel's course altering.

58. As a result of the collision, ***Atua*** was a total loss. The skipper of ***Waitohi*** sustained concussion and was hospitalised overnight.

59. The collision happened in a relatively open section of Queen Charlotte Sound, with visibility not considered a contributing factor. The weather at the time was gusty westerly's, which put the waves on the port hull of ***Waitohi.***

60. The ***Waitohi*** skipper was using a GPS plotter, but had not activated the radar.

61. There is a general lack of structured documented training and supervision by DOC for its skippers who hold commercial maritime qualifications outside their Part 35 approval. DOC has failed to follow its own SSM system for ongoing assessment of skippers. The skipper of ***Waitohi*** has held his CLM license since 1987 and has not had formal documented regular assessment of his competency since then.

62. The DOC operating systems do not identify single-person operations as a hazard. There is a satisfactory system for vessels under 6 metres but, apart from manning requirements, there is little else for vessels above this size.

63. There are minimal instructions and guidelines for best practice navigation and watchkeeping within the DOC operating systems. However, there are comprehensive procedures for many other parts of DOC vessel operations.

64. If the ***Waitohi*** skipper was wearing an engine cut-out lanyard, the collision may have been prevented, although it might have created other hazards.

Recommendations

65. As a result of the above findings, it is recommended that the Department of Conservation nationally makes changes to its vessel operational systems, to better adhere to existing SSM requirements and systems in the following areas:

    a) regular monitoring and documentation of skippers operating vessels over 6 metres in length

    b) single-man operational areas for risk analysis and lanyard use

    c) use of all navigational aids

    d) routine internal auditing of their own SSM system.

66. It is also recommended that the MNZ liaison advisor works with DOC to ensure these changes are embedded nationally.

DOC investigation report

67. The Department of Conservation undertook an internal investigation into this event. The main findings listed in their report are set out below:

a) That the Health and Safety Manager and National Boats Advisor consider introducing a regular assessment process for those who have qualifications outside the department's Maritime Rule Part 35 training scheme.

b) That the Health and Safety Manager and National Boats Advisor consider introducing a requirement for all solo boat operators of an outboard-powered boat in the department to wear an engine cut-out lanyard, and a recommendation when carrying other persons.

c) That area managers ensure that all means available for detection of other vessels (in this case, radar) are used (could be in active mode in fine calm weather, but in transmit mode in all other conditions).

d) That the Area Manager Sounds reinforces the importance of pre-trip boat checks.

e) That managers are reminded to document all training, including incidental training (man overboard, radar, and so on).

Comments from DOC

68. The following comments were made by DOC on April 2012 in response to the MNZ investigation report:

We recognise and accept there are areas of our boat operating procedures which do require improvement and have already taken steps to address some of these deficiencies.

- *A Sounds Area policy where all lone skippers must now wear a lanyard except at close quarter work where the vessel has slowed to less than 5 knots has been implemented and the Sounds Area Vessel Code of Practice has been updated to reflect this. Skippers were briefed about this at a meeting held on 8 December 2011. A national DOC policy is being drafted.*
- *Skippers have now been briefed on the need to use all available navigation aids aboard at all times.*
- *Regular meetings to discuss and disseminate information to all Sounds Area skippers and to provide structured training at least once a year have been implemented, with an initial skippers meeting having been held on 8 December 2011 and skipper training scheduled for June 2012. The **Waitohi**'s SSM manual has been reviewed and updated.*
- *A spreadsheet has been set up to document all training undertaken by skippers.*
- *On a national level, DOC's National Boat Advisor and Health and Safety Manager, since this incident, have been working on a more structured programme of training and assessment for licenses other than the Part 35 programme.*