

Investigation Report  
Grounding of *Te Ika*  
17 June 2010





**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
GPS	Global Positioning System
HSEA	Health & Safety in Employment Act 1992
ILM	Inshore Launchmaster
knots	nautical miles per hour
LLO	Local Launch Operator
MNZ	Maritime New Zealand
MTA	Maritime Transport Act 1994
NZKS	The New Zealand King Salmon Company Limited
OOW	Officer of the Watch
Part 22	Maritime Rules Part 22
RRC	Restricted Radar Certificate
SSM	Safe Ship Management
STCW 95	Standards for Training, Certification and Watchkeeping 1995
TAIC	Transport Accident Investigation Commission
VOP	Vessel Operation Procedure



## Executive summary

On 17 June 2010, the vessel *Te Ika* was involved in a grounding incident. The vessel grounded on a mud bank immediately south of Shag Point shortly after departing Havelock. The vessel was travelling at 15 knots (7.7m/s) whilst operating in the hours of darkness and in restricted visibility. The vessel did not sustain any damage nor were there any injuries sustained on board.

The vessel is owned by The New Zealand King Salmon Company Limited (NZKS) and operated as a water taxi for transporting workers to and from sea based salmon farms situated in the outer Pelorus Sounds.

The evidence shows that the grounding incident was in part, a direct result of the skipper failing to properly apply the safe navigation requirements of Maritime Rule 22.5 (Look-out) and Maritime Rule 22.6 (Safe speed).

The skipper was not fully familiar with best practice for navigating vessels in restricted visibility despite having completed the company's training requirements. The training programme operated by the company did not provide any ongoing assurance that the skippers of the vessels remained up to date with best practice and associated rules of navigation. Despite having no assurances, the company routinely relied on their expertise to navigate the vessel in restricted visibility.

The hazard identification process that NZKS used did not identify restricted visibility and the risk of grounding a result of poor watchkeeping as hazards.

If the hazard had been identified it is assumed that a system would have been adopted to minimise the inherent risks associated with the passage of a vessel in transit from the berth to the farm. Any system adopted by NZKS would have been a positive step in the prevention of such an incident.

As a result of the investigation a number of recommendations have been identified and these are contained at the end of this report.



## Factual information

1. The information used to compile this report was obtained from an analysis of the statements provided by the skipper and passengers of the vessel involved; management of NZKS; documents provided by NZKS; and information held by MNZ.

## Vessel

2. NZKS own eight vessels that they use for different functions. Around the farms they have four small tenders, and they own one large work vessel. For transporting employees to and from the farms, the company owns and operates three small water taxis, all under 8 metres long, including *Te Ika*.



Figure 1 *Te Ika*

3. *Te Ika* is a 7.80 metre standard McLay designed aluminium mono hull, powered by a four stroke Yamaha outboard. The vessel is fitted with a Furuno Navnet which combines a Chart-plotter GPS and RADAR. The unit utilises Navtronics Gold © charting software. The vessel is not fitted with an echo sounder. The normal operating speed for the *Te Ika* is 28 knots. The vessel had a valid Safe Ship Management (SSM) certificate at the time of the grounding.

## Company

4. The NZKS is a subsidiary of Evergreen Holdings Limited in partnership with Direct Capital Limited and is the country's biggest Chinook salmon producer. They NZKS currently have an annual turnover of \$100 million dollars. They have assets totalling \$75 million dollars and produce 55% of the world's farmed salmon. NZKS is based in Nelson with salmon hatcheries, farms and processing facilities across Marlborough and Canterbury.

5. NZKS employs 420 people across all of its operations and they have a line management hierarchy from the directors down to the farm managers.
6. The company's salmon farms are large floating structures with pens for raising salmon and associated activities. Some company employees live on the farms in purpose-built accommodation, generally working in shifts of seven days living on the farm and then taking seven days off work, back on land.
7. NZKS have appointed a Seafarms Manager to manage the operations on the salmon farms who is the designated person ashore (DPA) for all vessel operations. According to the NZKS vessel operations policy, the Seafarms Manager is responsible for the appointment, training and management of the vessel skippers and vessel operations.
8. Mostly, individual farm managers act as the skippers of the water taxis. The farm manager generally uses the vessel to transit between the berth and the farm everyday taking other farm workers as required. This was the case on board **Te Ika** on the day of the incident. The farm managers report directly to the Seafarms Manager.

## Narrative

9. On the morning of 17 June 2010 the skipper and three passengers departed the berth in the Havelock marina bound for a salmon farm at Forsyth Bay, in the outer Pelorus Sound. The time of departure was approximately 0630 hours. The weather was calm with heavy fog reducing visibility down to about 25 to 50 metres at times.
10. The skipper had the RADAR function activated on the Furuno Navnet. This gave a RADAR only screen and was operating with a range of 0.5 nautical miles. He was not using the GPS chart-plotting function.
11. Of the three passengers on board, one was a regular salmon farm worker, one was the General Manager of the NZKS processing plant in Nelson and the other was a business consultant contracted to NZKS, both of the latter two describe themselves as non-boaters. The farm worker went to sleep down in the bow area of the cabin whilst the other two sat in the wheelhouse talking with the skipper as they headed out of Havelock.
12. After the vessel cleared the 3 knot area of the inner marina, the skipper increased speed to about 5 knots. The vessel continued through the 5 knot zone around Cullen Point and then the skipper increased speed to about 15 knots after exiting this area. The vessel was on the plane at this time.

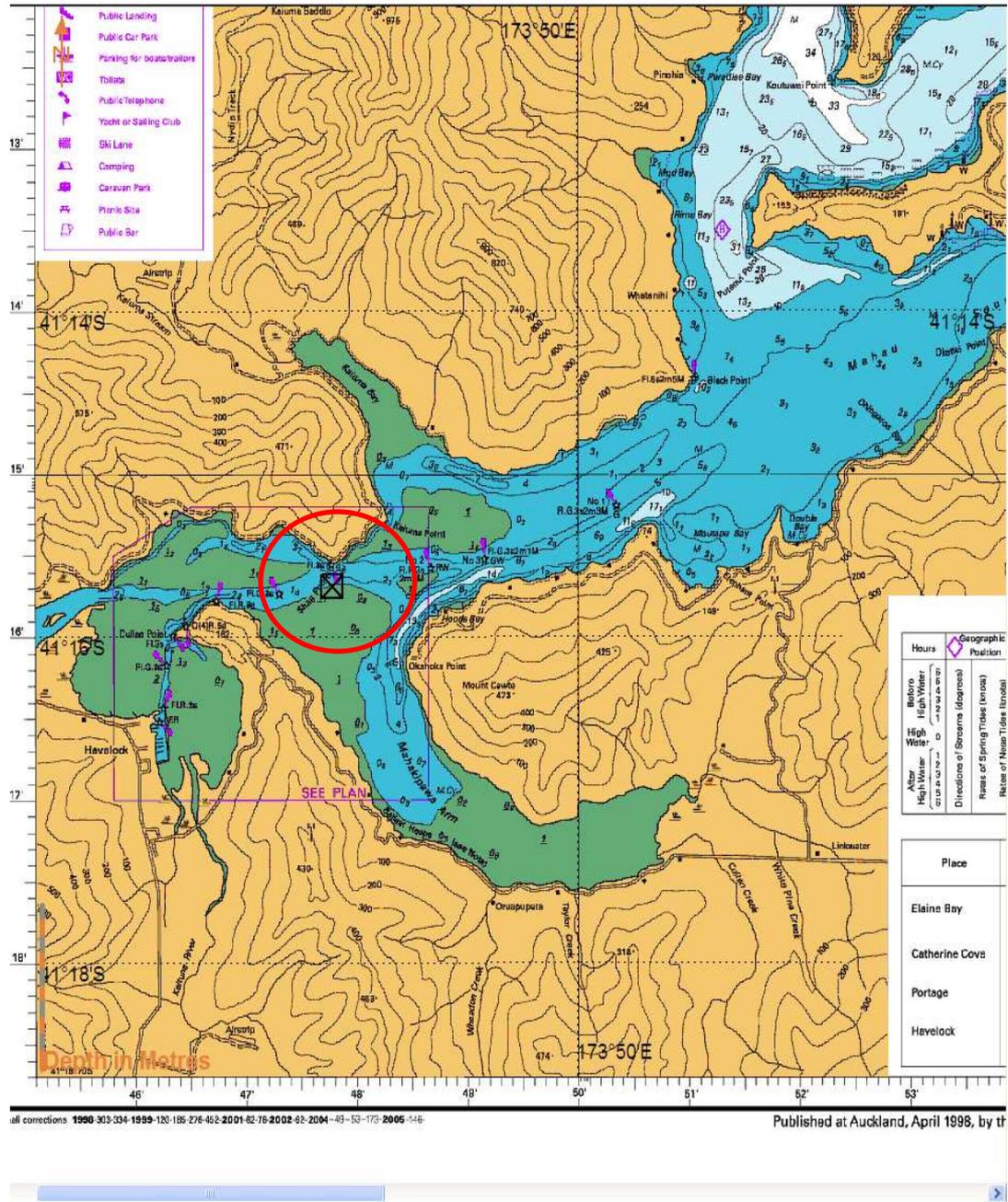


Figure 2 Havelock approaches (grounding position marked with boxed X)

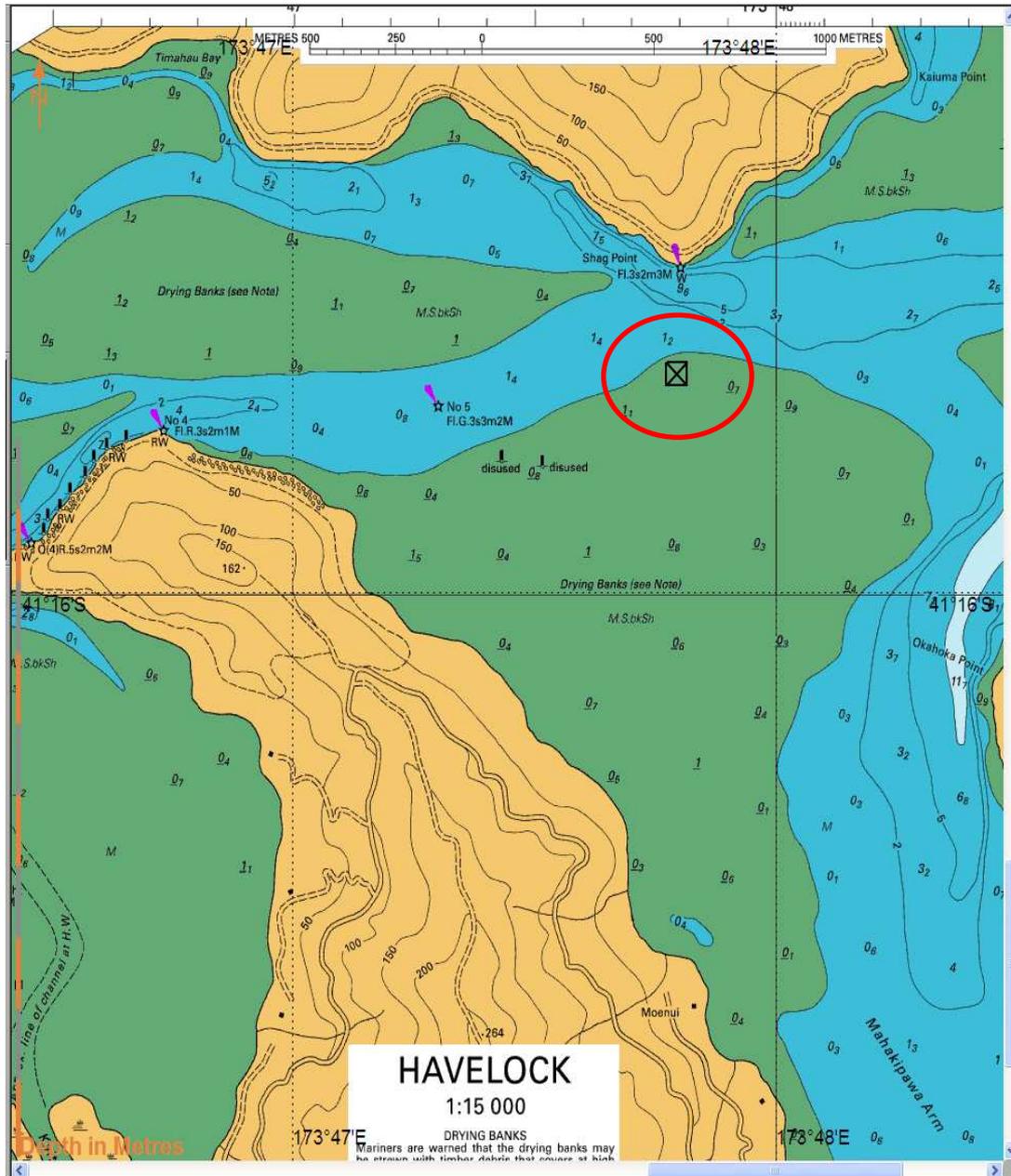


Figure 3 Large scale chart of area (grounding position marked with boxed X)



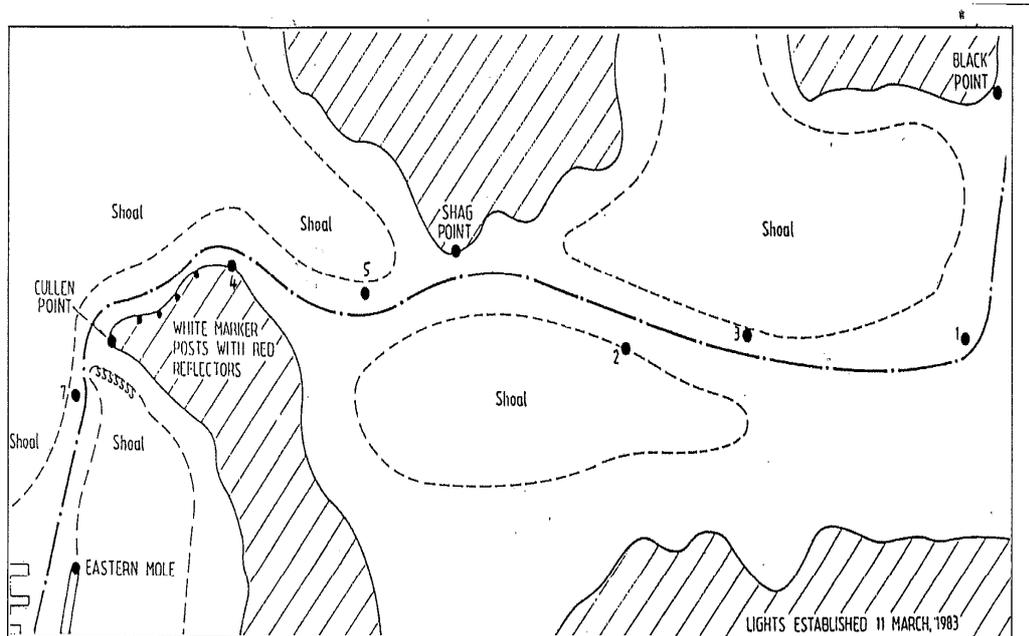
**Figure 4** Google Earth image of Havelock approaches

Google Earth

13. The skipper cleared beacon number 5 and headed broadly towards beacon number 2. He said he could see the light of the next beacon through the fog (see figure 5).
14. The vessel's outboard started to take the ground so the skipper reduced revolutions down to neutral as the hull slowly grounded. The vessel slowly listed over and came to rest on a mud bank south of Shag Point. Low water was predicted by the New Zealand Nautical Almanac for 0647 hours which was approximately the time of the grounding.
15. The skipper then tried to get the vessel off the bank by jumping overboard to push it. He soon sank up to his knees in mud and was unable to do any effective pushing. He returned to the vessel and waited for the flood tide to fill enough to float the hull off the bank.
16. Approximately 10 minutes after the grounding the skipper was able to use the outboard motor to slowly go astern and reverse the vessel off the bank and continue to the salmon farm. There was no damage sustained to the vessel and no injuries to any of the passengers.

# Analysis

## Havelock entrance



Supplied by courtesy of  
Marlborough District Council

### HAVELOCK APPROACHES NOT TO SCALE

NAME	No.	STRUCTURE	LIGHT	RANGE
Black Point		White Pile Beacon	Flash White 5 Secs	5 Miles
Moutapu	1	White & Green Pile Beacon	Flash Green 3 Secs	3 Miles
Hoods Bay	2	White & Red Pile Beacon	Flash Red 3 Secs	3 Miles
	3	White & Green Pile Beacon	Flash Green 3 Secs	1 Mile
Shag Point		White Beacon on Shore	Flash White 3 Secs	3 Miles
	5	White & Green Pile Beacon	Flash Green 3 Secs	2 Miles
Pull 'n Be Damned	4	White Beacon on Shore	Flash Red 3 Secs	1 Mile
Cullen Point		White Beacon on Shore	Flash White 3 Secs	3 Miles
	7	White & Green Pile Beacon	Flash Green 3 Secs	1 Mile
Eastern Mole		White Beacon on Shore	Flash Red 3 Secs	4 Miles

#### NOTES:

1. The Harbourmaster advises that vessels drawing MORE than 1.5m should approach and leave Havelock Harbour three hours each side of high water and preferably on a flood tide.
2. Do not attempt to head DIRECTLY from No. 2 Beacon to No. 5 Beacon, and to be safe your vessel should be within 50 metres adjacent to Shag Point before approaching No. 5 Beacon.
3. Shoal area marked SSSS adjacent to No. 7 Beacon does encroach across part of the channel and a slightly western approach (as indicated on this chart) is advised when approaching No. 7 Beacon.
4. PVC poles from No. 7 Beacon to the harbour entrance mark the western side of the channel.
5. Keep to the channel at all times as shoal areas quite often 'harbour' hidden logs and debris.
6. Minimum depth of water in Havelock Harbour is approximately 1.8m.
7. There is a speed restriction of 5 knots in the area Cullen Point to No. 4 Beacon.
8. Please slow down when passing other craft in the channel.
9. When requiring casual berthing please call at Port Marlborough New Zealand Limited's office at the main wharf.
10. Please give way and sea room to vessels with barges as these may be restricted in manoeuvring.

**CAUTION** — THIS DOCUMENT IS ISSUED AS A GUIDE ONLY. IT IS NOT TO SCALE, HAS NOT BEEN SURVEYED, AND IS NOT INTENDED FOR USE AS A NAVIGATIONAL CHART. THE LOCATION OF SHOAL AREAS ARE APPROXIMATE ONLY AND MAY CHANGE AT ANY TIME. THE ATTENTION OF MARINERS IS DIRECTED TO CHART NZ916 AND THE NEW ZEALAND NAUTICAL ALMANAC.

**Figure 5** Chartlet of Havelock approaches

Marlborough District Council

17. The approaches to Havelock require the vessel to be navigated around various mud banks which dry at low water. There are a number of navigational beacons along the route which can be used night and day. The grounding was on the shoal between beacons 5 and 2 immediately south of Shag Point.

## Passage planning

18. It is well established that a passage plan has the following four key elements as per the requirements of STCW 95. Although aimed at larger vessels than *Te Ika*, these key elements are of great relevance to the grounding of *Te Ika* and the skipper's actions:
- **Appraisal:** This is the operation carried out by the navigation officer, or in this case the skipper, who gathers all the relevant information that benefits the future stages of the passage plan.
  - **Planning:** The passage plan must include pilotage waters and cover the total period from berth to berth. This must include charted course lines; the lines to be marked in three figure notation, giving the intended direction of the vessel's track. One of the main functions of the plan is to highlight the danger areas where the ship should not go and hence remain in safe navigable waters.
  - **Execution:** The execution of any passage plan is the formulation of the tactics, which are intended to carry the plan through. Consideration should therefore be given to the reliability of the ship's equipment (specifically the navigation equipment), its condition and limitations together with its degree of accuracy and reliability. Account should also be given to the level of expertise of the ship's officers and whether they are familiar with the equipment.
  - **Monitoring:** When the above three stages are completed, the monitoring of the passage plan is of fundamental importance. This is achieved by monitoring the vessel movements from the moment she leaves the berth until she completes her passage plan and arrives at the destination berth.
19. The following is a summary of the passage plan for *Te Ika* at the time of the incident:
- **Appraisal:** Recognised the foggy conditions.
  - **Planning:** The following navigational points were not practiced on *Te Ika*:
    - Plotting the vessel's intended course lines on paper charts or any other notation.
    - Marking these course lines with the true heading in three figure notation with margins of error.
    - Identifying and plotting on official paper charts the danger areas that are considered high risk for navigation.
    - The use of navigational cards containing clearing bearings, clearing distances, and wheel over positions. These are particularly useful for small boat navigation as a quick reference for the skipper with the use of radar.
  - **Execution:** No documented plan for operating the vessel in restricted visibility was available to the skipper.
  - **Monitoring:** The skipper was not monitoring the position closely enough as the vessel strayed south of its intended course.
20. The skipper confirmed that he had no formal documented passage plans in place for transiting to and from the salmon farms. He said that he keeps 200 to 250 metres off (south of) Shag Point so the vessel remains outside the 200 metre 5 knot requirement. The use of paper navigation charts in this class of vessel is not industry standard because there is not enough room to display the chart effectively.
21. The skipper navigated on a course that took the vessel to the south of the safe water passage used during a normal transit with unrestricted visibility. Essentially it is up to the skipper on the day to determine the best route to take at any given time.

22. NZKS confirms that it does not have procedures specifically regarding passage plans for any of its water taxi class of vessel. There are various topics discussed in a number of company documents that refer to safe operation, but no specific section devoted to this topic. There is a 'cruising' section contained within the vessel operations policy for each individual vessel. However this does not provide any recommendations for the passage or its planning.
23. There is generic passage planning information contained within the SSM template information provided to NZKS as part of MNZ liaison with the company.
24. Passage planning or safe navigation does not form part of the vessel operations policy document. When asked about his passage plan the skipper replied:
- Skipper: I usually travel at about 200 metres off a bit more obviously, that's 250 metres off, so there's no actual I mean it's not a course plotted on the radar*
- MNZ: but you have a course, a passage plan for heading out using radar alone in restricted visibility?*
- Skipper: Only through my experience*
- MNZ: So you don't have it written out*
- Skipper: I don't have it*
- MNZ: It's in your head,*
- Skipper: Yeah that's right,*

## **Skipper**

25. The skipper has been employed as a farm manager by NZKS for 13 years. He holds a Local Launch Operators (LLO) certificate of competency issued in 2008. The certificate is correctly endorsed with the vessel **Te Ika** as one of the nominated vessels. The certificate is due for revalidation in 2013.
26. The skipper attended a New Zealand Coastguard Boating Education RADAR course in 2007 as part of NZKS requirements. He has also attended and passed the statutory one week Restricted RADAR Certificate at the School of Marine Studies at Nelson Marlborough Institute of Technology. The certificate for this course was issued on the 12th of March 2010, some 97 days before the grounding of **Te Ika**.
27. The skipper's NZKS personal file shows a number of vessel operator sign offs as per VOP every 4 years. The last sign off of vessel operations was February 2009 by another skipper following annual refresher and exam.

28. The skipper followed Appendix 4 of the VOP (Water taxi check offs form) to check off vessel personnel using the water taxi class of vessel. There are a number of headings used:
- a) Pre-start checks
  - b) Fuelling, starting, shutdown
  - c) Departure, driving, parking, mooring
  - d) Navigation aids (radar and GPS)
  - e) Fuel, electrical, davit, bilge
  - f) Lifejackets
  - g) Pyrotechnics, anchoring, fire fighting
  - h) Speed around farm
  - i) Manning requirements and operational distances
  - j) Read and signed Vessel Operation Procedures (VOP).
29. The VOP does not require skippers to provide any assurance to NZKS that they remain familiar with the collision prevention and safe navigation rules. This appears to be industry standard.

### **Best practice navigation and watchkeeping**

30. The following are extracts from the Bridge Procedures Guide(written by the International Chamber of Shipping to bring together the good practice of seafarers in the aim of improving navigational safety and protecting the environment):
- Navigation
  - General Principles
  - Monitoring the progress of the ship
  - Good navigational practice demands that the OOW (Officer of the Watch):
    - 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 i.e. 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.
31. While the guide above has been developed for use in larger vessels the basic principals of safe navigation apply to all vessels at sea. Moreover, it is incumbent on masters and skippers of small vessel to adhere to such principals to ensure the vessel's safety and those on board.

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

*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.*

*Restricted visibility*

- (c) *When restricted visibility is encountered or expected, the first responsibility of the officer in charge of the navigational watch is to comply with the relevant rules of Part 22 – with particular regard to the sounding of fog signals, proceeding at a safe speed and having the engines ready for immediate manoeuvre. In addition, the officer in charge of the navigational watch should immediately-*
- (i) inform the master of the restricted visibility; and*
  - (ii) post a proper look-out; and*
  - (iii) exhibit navigation lights; and*
  - (iv) operate and use the radar.*

33. As noted above, there are a number of rules and best practice guidelines surrounding the development and implementation of good watchkeeping practises on board vessels at sea.
34. The Seafarms Manager was a FishSAFE aquaculture mentor. The FishSAFE guidelines have been distributed to NZKS and have been sighted at the salmon farms. The guidelines provide information relevant to this event in areas such as look-out, navigation and restricted visibility.
35. All of the NZKS vessels and personnel in charge of them are certified as being compliant with the Safe Ship Management system under Maritime Rules Part 21, and as such must adhere to all applicable maritime rules and legislation.
36. Maritime Rules Part 22 (Collision Prevention) applies to all vessels navigating in New Zealand waters. The incident involved a New Zealand ship and was within the New Zealand territorial sea, therefore Part 22 applied at the time of the incident.
37. During his first interview with MNZ, the skipper was questioned about his understanding of the rules pertinent to this matter, namely Maritime Rule 22.5 (Look-out) and Maritime Rule 22.6 (Safe speed).
38. In the opinion of the investigator the skipper was not clear on the requirements of Maritime Rule 22.5 (Look-out) with regard to 'all available means'. The following is an extract from the interview with the skipper:

*Skipper: I feel I used all the available means to the best of my knowledge, I was using the radar on full screen, I prefer to use the radar on full screen, because it's just again that you can see anything that's coming towards you and by maintaining a proper look-out by sight, I was looking out and I guess the other guys in the cabin were looking out, I hadn't said to them, can you please look out, but they were looking out*

*MNZ: Well you guessed*

*Skipper: Yeah I guessed they were, yeah, yeah*

*MNZ: But you're not sure?*

*Skipper: No well, I mean they were up in the cabin, looking out, one passenger was looking back and the other passenger can look at me occasionally when he was talking to me.*

*MNZ: You'd have to question whether they were looking out, you would have to question that wouldn't you?*

*Skipper: Yeah*

39. Likewise the skipper was not clear on the requirements of Part 22.6 Safe Speed with regard to the considerations to be taken into account for determining a safe speed. The following is an extract from the interview with the skipper

*Skipper: Oh it was so I felt comfortable I wasn't going to do any damage, I mean, well I don't know, how do you say it? It wasn't going to come to grief really*

## **Look-out**

40. An effective look-out must be maintained to ensure the safe passage of a vessel during the course of its voyage. By maintaining an effective look-out, navigational marks such as headlands and navigational buoys and beacons can be identified and cross referenced as the vessel progresses along the course of its passage.
41. Maritime Rule 22.5 requires a master to use all available means appropriate in the circumstances and conditions to maintain a proper look-out, in order to appraise the situation and risk of collision. Whilst this matter did not result in a collision between two vessels, the failure to maintain an effective look-out by identifying navigational marks and verifying the vessel's position in relation to them did result in the vessel grounding.
42. There were two passengers awake in the wheelhouse but they were not used to any formal watchkeeping function, nor would that have been appropriate given they held no relevant qualification and had both independently described themselves as non-boaters.
43. As discussed above the evidence indicates that a look-out was maintained on the vessel by RADAR alone. By not using all of the available functions fitted on the Furuno Navnet to verify the vessel's position, course and speed, the skipper was not able to make a full appraisal of the situation resulting in a loss of situational awareness and the subsequent grounding of the vessel. The skipper did raise concerns at the time of his MNZ interview about the GPS charts; this is discussed later in this report.

## **Safe Speed**

44. Maritime Rule 22.6 (Safe speed) requires masters to maintain a safe speed for the prevailing circumstances and conditions.

*"so that proper and effective action to avoid a collision can be taken and the vessel can be stopped within a distance appropriate to the prevailing circumstances and conditions."*

This requirement is reiterated in part of Maritime Rule 22.19 (Conduct of vessels in restricted visibility) which states:

*"Every vessel must proceed at a safe speed adapted to the prevailing circumstances and conditions of restricted visibility."*

45. From interviews with the skipper and passengers it is evident that it was (foggy restricting visibility) and as a result, the skipper should have adopted a safe speed for the prevailing circumstances and conditions.
46. The skipper stated that the speed of 15 knots was appropriate in the conditions at the time. When questioned further, this speed is less than the vessels normal operating speed (28 knots) in clear visibility conditions and the skipper said he 'felt comfortable' at the time with 15 knots.

47. The Seafarms Manager was questioned after reading Maritime Rule 22.6 (Safe speed) the following was stated:

NZKS: *Well state of visibility, yeah, I mean I'd say definitely there I mean we've got obviously got fog in daylight, and other weather conditions I guess, traffic density is well it's very occasional and it does have a certain amount of traffic because of the marina; manoeuvrability of the vessel with special reference to stopping distance. I mean often with the fizz boats while highly manoeuvrable they're also travelling at speed at probably you'd have to be careful of the speed position and stopping distance, but it also affects your visibility you cover a lot of ground I guess ..... at night presence of background lights such as shore lights or from the backscatter of the vessel's own lights, I mean that does apply but I guess you know you're driving into quite a well lit area and you tend to see the boats in Havelock, depending I mean again depending on the situation, state of wind sea current approximate, that vicinity of navigational hazards, well you've got to keep an eye out for your beacons there, if there's any unlit ones obviously coming in, and the draught in relation to the depth of the water, ..... narrow channels*

MNZ: *Right*

NZKS: *So you've got to be careful to stay out on track*

MNZ: *So you'd say all of those points are pretty important for navigating in the Havelock Marina?*

NZKS: *Yep*

48. Despite NZKS agreeing that the maritime rule regarding safe speed was "pretty important" this information does not form a large part of their policy or procedures.
49. Given the lack of vessel traffic in the area, and the calm conditions existing on the day, a speed of 15 knots in itself cannot be considered unsafe. However, when taking fog into account, which reduced visibility down to between 25 and 50 metres, operating in the pre-dawn hours of darkness, coupled with the navigational hazards in the Havelock approaches, it is reasonable to expect that a reduction in speed would be the minimum action necessary to safely navigate the vessel. Unless some other course of action is taken such as extra look-outs and utilisation of the GPS chart-plotter in conjunction with the RADAR.

## Electronics

50. **Te Ika** is fitted with a Furuno Navnet multi function GPS chart-plotter/RADAR unit. As stated earlier, the skipper confirmed that he was navigating at the time of the grounding by RADAR alone. He also stated that this was his preferred means of navigation.
51. The skipper did have the option to utilise the Furuno Navnet GPS chart plotting facility, however chose not to do so. The plotting facility would have shown the vessel's position on an electronic chart in relation to the navigational aids and general topography of the area. This would have allowed the skipper to determine whether or not the vessel was either on or off track.
52. The chart-plotting function uses Navtronics Gold© charting software. This receives a GPS signal from the internal receiver which is in-turn displayed in real time on a navigational chart of the area. The skipper confirmed that he thought the position as displayed on the chart was 20 to 30 metres off. He had become aware of this over a period of time although had not made it known to the Seafarms Manager until after the grounding.

53. The vessel was not fitted with an echo sounder, although NZKS initially indicated that one will be fitted in the near future this is now not the case.



Figure 6 Furuno Navnet in split screen mode

## Training

### Radar

54. The skipper confirmed during the first interview with MNZ that fog and restricted visibility was a reasonably common occurrence in the inner Pelorus Sound/ Havelock area.
55. The skipper attended a New Zealand Coastguard Boating Education RADAR course in December 2008. According to the Coastguard Boating Education website, the NZ RADAR Certificate is a 6 hour course. The web site lists that the following topics area covered:-
- Principles of RADAR
  - Components of RADAR set
  - Controls
  - Displays
  - Targets
  - RADAR navigation
  - Collision avoidance

56. The skipper also attended a 5 day statutory Restricted RADAR Certificate (RRC) course and the Nelson School of Marine Studies at the Nelson Marlborough Institute of Technology. His certificate was issued in March 2010. The RRC is not required for holders of an LLO certificate. The course is however a requirement for all mariners above the LLO level.
57. The Restricted RADAR Certificate covers the following topic areas:

Topics	Topics
History	Magnetic radiation
How RADAR works	Main components
Scanners	Transmitter
Magnetron	Display
Receiver	Amplifier
Basic operator controls	IMO control symbols
Range	Effects of weather conditions
Echoes	Display modes
Bearing and range discrimination	Side lobe effect
Sea clutter	Effects of moisture in the atmosphere
X band and S band	Targets
Ice	Poor target
Coastal features as RADAR targets	Position fixing
Plotting	Parallel indexing
Collisions	Conduct of vessels in restricted visibility

58. Despite the two RADAR courses the skipper provided the following answers when questioned about RADAR operation:

*Yeah, I was under the impression that it would be fine to use it as it was, I hadn't realized before that it didn't pick up the drying banks, cos that auto setting is pretty good, it'll pick up a log in the water or a seagull on the water that's the thing, it's a pretty good radar.*

59. The RADAR that **Te Ika** is fitted with has an auto tune function. This allows the unit to automatically tune to ensure that a clear picture is presented at all times. The skipper had this function activated at the time of grounding and was not sure how to change this or how to manually tune the RADAR. Operators need to know how to manually tune the RADAR particularly when there is a change in operating conditions such as rain, sea state or visibility. This helps to ensure that the unit is being used at its maximum potential and helps to give the operator confidence that the display is true.
60. The skipper said the following regarding manual tuning during his first interview:
- "...but if I'd had in hindsight if I had been using it on the manual setting and I might have been able to pick up that drying ..."*

### **Local Launch Operator (LLO)**

61. The skipper passed the examination for LLO in August 2008 after attending a course in Picton. The LLO syllabus has a number of topics that are pertinent to this incident including a section about describing the precautions to take in poor visibility with regard to the following:
- i) Speed
  - ii) Fog signals
  - iii) Look-out
  - iv) RADAR
  - v) Navigation lights
  - vi) Echo sounder
  - vii) Auto pilot

### **Company procedures**

62. The VOP<sup>1</sup> appears to be an important key document within the NZKS operating system. NZKS confirmed that the policy is a "how-to guide" for the operation of the NZKS fleet. NZKS Management has signalled that this policy supersedes each vessel' Safe Ship Management Manual.

*[NZKS] has a range of vessels that are used by team members for transportation to and from the Seafarms. Vessels are intended to be used only for company business. This policy is intended to ensure vessels are operated in safe and responsible manner so as to minimise risk to personnel and property within [NZKS]. This document supersedes the vessels Safe Ship Management Manuals.*

63. Under section 13.11 the following is stated:-

*The Seafarms Manager is the Designated Person Ashore (DPA). He is responsible for the appointment, training and management of the vessel skippers and vessel operations. He is the contact person for all matters regarding the vessels with the exception of maintenance and repair (which is the responsibility of the Engineering Supervisor), however the Seafarms Manager is to be copied in on any maintenance or survey issues.*

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<sup>1</sup> See appendix II for entire policy.

*As DPA the Seafarms Manager must ensure the safe operation of each vessel and to provide a link between management and the Skippers and crew, he is to have direct access to the highest level of management. He must monitor the safety and pollution protection aspects of the operation of each vessel and ensure that adequate resources and shore based support are applied, as required. Maritime Rule Part 21, SSM.*

64. Under section 13.12 the following is stated:-

*13.1.2 Owners responsibility*

*The New Zealand King Salmon Company Ltd is committed to the successful implementation and maintenance of this vessel operating policy. This means ensuring:*

- the vessel is fit for purpose at all times,*
- skippers know and follow the procedures outlined in this policy,*
- the vessel remains compliant with all aspects of the Health and Safety Act and compliance to the Maritime Transport Act, 1994 and applicable maritime and marine protection rules.*

65. Section 13.15 states

*To ensure our vessels are operated in a safe and responsible manner only people who have undertaken appropriate training are permitted to operate vessels. The training will vary according to the vessel type and the area the person is required to operate within.*

66. Further on in section 13.15 it states

*is appointed (in writing) by the Seafarms Manager as able to operate the vessel by themselves – this appointment process will occur every four years following revalidation of the sign-off sheet.*

*A copy of all certification is to be stored on their personal files in Nelson.*

67. The Seafarms Manager states that part of his role is to visit the salmon farms regularly. During these trips he rides on the water taxis and said he is able to observe the operation and navigation of the vessel. These are done in addition to the more formal reporting done on the Appendix 4 document in the VOP.

68. The specific operating parameters for **Te Ika** are contained within section 13.1.11 of the VOP. The policy covers headings such as Start up, Cruising, Shut down, Important and Safety brief. Items that are pertinent to this incident are:

- turn on radar if required*
- maintain a good look out at all times.*
- if operating in low light conditions turn on navigation and anchor lights, check that both are working before leaving port.*

69. As discussed earlier, look-out should be maintained using ALL available means. This should include operational RADAR being turned on every time the vessel leaves the berth. NZKS stated that the RADAR should be turned at the skipper's discretion.

70. The definition of what ‘Low Light’ is not discussed in the VOP and the assumption is made that this refers to navigating in the hours of darkness rather than restricted visibility. NZKS stated the following when questioned about low light:

NZKS *I guess what low light is meant to mean there, is the time that you should be using the navigation lights, the times that you should be using your navigation lights, so it would probably would link to restrictive visibility I guess*

MNZ: *You’re guessing but how does Rick know?*

NZKS : *Oh I see, so I mean with Rick it would be dark and in the fog*

MNZ: *Ok. So do we have any definitions, I’m not sure you guessed that it was dark or in the fog, I guessed that it was in the dark. How does Rick, Damian, Rohan, Salvador and Charlie know what low light is?*

NZKS: *So I guess what low light means there and I use the word I guess, it’s probably I interpret low light is meant exactly that so when we’ve got low light dark or during the fog.*

MNZ: *So in low light I turn the navigation and/or anchor lights on*

NZKS: *Yeah*

71. Despite this explanation of what ‘Low Light’ means it is not clear what the skipper should do when they encounter this phenomenon.

72. There is no mention of specific watchkeeping practises or general guidelines for passage making within the VOP other than ‘*maintain a good look out at all times*’. Guidance is available in the FishSAFE guidelines that NZKS have copies of.

## **Seafarms manager**

73. The Seafarms Manager holds an Inshore Launch Masters (ILM) certificate of competency. He upgraded this certificate from a Commercial Launch Masters (CLM) certificate of competency in 2009. The CLM was completed in 1997 this was when the formal learning took place with regard to collision prevention rules.

74. He stated that he signed off the water taxi skippers as part of his role as Sea Farms Manager. Despite his training and longevity at NZKS, when questioned about Look-out and Safe Speed he said:

MNZ *Yeah ok, ok and cruising it says, maintain a good look-out at all times, tell me what good look-out means?*

*Seafarms Manager: Some good term I should be able to quote here, but I mean it’s basically maintaining a good look-out for the situation so the situation obviously changes or the situation that presents itself will often change, it’s making sure you’re using a look-out that’s adequate in the situation*

75. He holds similar maritime qualifications to the people he is assessing. NZKS has no assurance that the Seafarms Manager retains a level of knowledge above those that he is assessing. He has skills to produce a good quality salmon product and this is the core business of NZKS. In the opinion of the Investigator the Seafarms Manager needs to receive some remedial training in vessel operations and operator training.

76. The Seafarms Manager stated that as part of the system the observations can be delegated to another skipper. However the Seafarms Manager must observe at least six hours himself. The person that observed the skipper of **Te Ika** during 2009 was another company skipper who holds an ILM.
77. NZKS confirmed they do not have any means of externally assessing the skippers or the Seafarms Manager to provide any ongoing assurance that the skippers of the vessels remained conversant with applicable maritime rules. Despite having no assurance, the company routinely relies on their maritime qualification to navigate the vessels as a default setting.

## NZKS Hazard Identification

78. NZKS operates a Hazard ID Register –Seafarms. This document lists hazards associated with the operation of salmon farms and all the ancillary tasks such as vessels, cranes, diving, feeding for example to run a safe salmon growing operation. MNZ was supplied with a hazard register by the Seafarms Manager following the grounding. The document had been updated on 23 June 2010, 6 days after the grounding.
79. The Register has a section entitled 'Hazards associated with boat use around the salmon farm'. This section has the following hazards listed:
- i) Fuel igniting
  - ii) Hit by other vessel-collision
  - iii) Grounding (Seafarms Manager confirmed that this hazard was added after the **Te Ika** grounding).
  - iv) Swept away/falling overboard
  - v) Vessel stability
  - vi) Fire
  - vii) Loss of power
80. The controls to eliminate, isolate, or minimise the new grounding hazard are:
- i) Trained operators only to be using boats and have valid licences
  - ii) Visibility optimised and no distractions.
  - iii) Operate vessels under 5 knots within 200m of marine farm licence and the shore.
  - iv) Use RADAR and GPS and sounder (if fitted) and assign extra watches as appropriate.
  - v) Ensure you know your exact position / route (e.g. GPS) – if not stop and re-orientate.
  - vi) No cell phone use while vessel is underway.
81. NZKS do have trained and licensed operators using the boats but appear to have solely relied upon this training and could not be assured the skipper(s) are fully conversant with applicable rules.

82. Of particular interest is that there is no heading or specific hazards identified for the water taxi class vessels transiting to and from the salmon farms. There are as discussed above hazards listed under the heading of 'Hazards associated with boat use around the salmon farm'. NZKS confirmed that the intent of this heading is to encompass all boat operations either in the Marlborough Sounds or anywhere else NZKS vessels may operate.
83. Further, the following controls are listed for the hazard of fire on board a vessel:
- i) *Use the VHF to alert a Mayday.*
  - ii) *Skipper will decide appropriate fire fighting action – if too large abandon vessels through life raft (Milton Bay). Take EPIRB with you.*
  - iii) *Use fire extinguishers to fight fire.*
  - iv) *Complete incident report.*
84. It seems clear that the 'controls' listed for this hazard are in fact a set of procedures following a fire, rather than controls to prevent a hazard in the first place. This type of control/procedure issue is encountered throughout this section.
85. Health and Safety legislation clearly sets out the process for the systematic identification and controls of significant hazards in the work place.
86. There is no mention anywhere in the entire register whether any of the controls listed for any of the hazards either eliminates, isolates or minimises the listed hazard even though there is specific space provided for this notation.

## Audits and inspections

### ACC

87. NZKS is part of the ACC Workplace Safety Management Practises (WSMP) programme. The programme has three levels and reflects the strength of the workplace with regard to safety management practises. NZKS has attained the top level which is Tertiary which gives a 20% discount on their ACC levies.
88. ACC contracted an external auditor to undertake a one day audit of NZKS in 2009. This was completed and NZKS maintained the tertiary level and discount. ACC confirmed that the auditors are chosen by the company (to be audited) from a list of potential auditors. These people may not have specialist skills and knowledge in the industry they are auditing.

### Maritime New Zealand

89. According to Navigator, (MNZ's internal vessel database), the three water taxi class vessels were inspected on the following dates:
- ***Te Ika*** on 26 January 2010
  - ***Kekeno*** on 16 September 2009
  - ***Hamana*** on 14 December 2009
90. No serious safety issues were noted in the database for any of the vessels.
91. Following recommendations made in the Transport Accident Investigation Commissions' (TAIC) report into a previous NZKS water taxi fatality, MNZ initiated a series of visits to NZKS which involved two MNZ staff. The purpose of these visits was to offer advice, guidance, resources and provide feedback to NZKS regarding vessel operations. The visits were not audits and were purely for liaison and assistance.

92. In October 2009, two MNZ staff visited the Picton office of NZKS and worked with the Seafarms Manager. In a summary provided to NZKS and MNZ, the following was submitted:

Suggestions were made to NZKS such as:

- *Watchkeeping procedures were unclear and scattered throughout the Sea Farm manual. These are to be customised and made clearly available to all vessel skippers*
- *Trip reporting procedures to be implemented. Currently there are no checking procedures to verify that the vessel has arrived at the farm or back to the base in the evening*
- *Emergency response procedures to be customised and to add one for collision*
- *Some at-sea-checks to be implemented for each vessel*
- *Some basic stability guidelines for each vessel to be added to the operations manual*
- *Add owner's responsibilities to the system*
- *Consider adding garbage management plan to vessels that carry more than 15 persons*
- *Review induction process for new vessel operational staff*
- *Ensure a document control process is added. Currently components of the vessels systems are held in many locations. When requested by the local MSI confusion as to location can occur*
- *the operational manual may be too generic and may have been overly simplified*
- *The vessel operational plans in the Sea Farm manual have not been placed in a high profile location.*

93. Based on the above, the following conclusions were reported internally to MNZ's General Manager Maritime Services:

*King Salmon have huge resources and have a very in depth system for many components of their business.*

*They have achieved tertiary level WSMP [Workplace Safety Management Programme] for their HSE and meet the requirements that entails.*

*My thoughts are that possible negative influences on their vessel operation could be contributed by:*

*Lack of focus placed on the vessel operation and required systems*

*Operational manual for the vessels may have been simplified too far and hence created gaps*

*Sea farm Manager accepts recommendations but appears to believe his way may be better placed for the operation*

*Risk*

*I agree with the Farms Manager that the vessel operation and their use should be low risk*

*This belief has perhaps contributed to the lack of focus on their vessel operation and hence the over simplification of the vessels operational manuals*

*The operation I believe poses a moderate risk at this time but further education and assistance should reduce this.*

94. In December 2009 two MNZ staff visited the Pelorus Sound Salmon Farm. In a summary provided to NZKS and MNZ the following was submitted:

*NZKS have very comprehensive systems and policies for both the farm and vessel operations side of the business.*

*I have no doubt that the salmon producing side of the operation is to the highest level*

*Your HSE system has been well thought out and is very noticeable around the site*

*Although I do feel that more emphasis could be placed on ensuring all systems and policies are being followed at all times.*

*As with many companies management must be aware that any systems or policies they create in the office environment must be followed by an implementation plan and rolled out able to be utilised in the actual field of operation.*

*More internal review or audits by management should be considered and will result in a better buy in and understanding of all the NZKS systems.*

*The implementation of the new annual vessel operations exam is a good concept and could be considered as a possible audit/review tool for all NZKS systems and policies if found effective over time.*

95. In June 2010 two MNZ staff visited the Queen Charlotte Sound Salmon Farm. They reported the following internally to MNZ's General Manager Maritime Services.

*NZKS have implemented nearly all recommendations that MNZ have suggested.*

*In many cases they have taken the initiative and added additional safety features*

*It is obvious that over the time we have been working with NZKS improvements have been made and the vessel operations policy is becoming better understood and utilised by NZKS.*

*If NZKS management maintain the current focus on vessel operations and implement the above recommendations then I am comfortable they will continue to operate in a safe manner*

*I do not feel that a section 54 audit at this time is warranted for NZKS*

96. On 16 June 2010, based on the programmes findings, the MNZ General Manager Maritime Services decided in consultation with the staff involved to postpone a possible audit of NZKS under section 54 of the MTA for six months "to ensure the cultural changes in their organisation (NZKS) are embedded".

## **Transport Accident Investigation Commission (TAIC)**

97. The TAIC report into the **Shikari** accident made the following statements in the report's Safety Actions section:

*After the accident NZ King Salmon revised its vessel operating procedures to require that all trained and approved skippers had their competency re-assessed every 5 years. This reassessment included observation of their driving practices and ensuring their knowledge of the relevant navigation by-laws.*

*After the accident NZ King Salmon reviewed its internal procedures to reinforce the need to comply with all Maritime Rules, and limited the use of cell phones by skippers operating its vessels.*

98. Despite the findings of TAIC there appears to be no documented formal process within NZKS to determine the skipper knowledge of navigational by-laws and compliance with all maritime rules.

## **Maritime Transport Act 1994 (MTA)**

99. The MTA stipulates broad principles of maritime law and are based on international ship safety conventions. Sections 34 and 36 of the MTA allows for maritime rules to be made requiring certain technical standards and procedures to be satisfied.

## **Skipper**

100. Section 66 of the MTA provides that a breach of a Maritime Rule constitutes unnecessary danger or risk for the purposes of section 65 of the MTA, unless there is evidence to the contrary. As stated previously in the report, the evidence shows that the skipper failed to act as required by Maritime Rule 22.5, and 22.6, which resulted in the grounding incident.
101. Section 65(1)(a) of the MTA relates to dangerous activities involving ships and it states:
- Every person commits an offence who operates, maintains, or services or does any other act in respect of any ship or maritime product in a manner which causes unnecessary danger or risk to any other person or to any property, irrespective of whether or not in fact any injury or damage occurs.*
102. The skipper operated **Te Ika** in a manner which caused unnecessary danger to the three passengers and risk to the vessel. By not navigating at a safe speed, with regard to the restricted visibility and failing to keep a look-out by all appropriate means, which resulted in the grounding of the vessel.
103. Given the skipper's breach of the rules, as outlined above, and that it was not necessary for the vessel to pass so close to the mud bank and ground, an offence under section 65(1) of the MTA can be established on the facts.

## **NZKS**

104. Section 65(2)(a) of the MTA relates to dangerous activities involving ships and it states:
- Every person commits an offence who causes or permits any ship or maritime product to be operated, maintained, or serviced in a manner which causes unnecessary danger or risk to any other person or to any property, irrespective of whether or not in fact any injury or damage occurs.*
105. There is a significant body of case law precedents relating to the actions of the people who work for companies, and how the companies are vicariously liable for those actions. For the purposes of assessing NZKS duties under section 65(2)(a) of the MTA, the company was directly responsible for ensuring that **Te Ika** was operated safely by the skipper / manager.
106. In accordance with section 65(2)(a) of the MTA, NZKS is the "person" who permitted **Te Ika** to be operated in a manner which caused unnecessary danger and risk. The vessel was not operated at a safe speed in restricted visibility and there was a failure to keep look-out by all appropriate means. The result of this manner of operation was the grounding of the vessel.

## Health and Safety in Employment Act 1992

107. The HSEA places duties on all people who are at work including employees.

108. Section 19(b) of the HSEA states:

*Every employee shall take all practicable steps to ensure that no action or inaction of the employee while at work causes harm to any other person.*

109. From the earlier assessments of the facts in this case, it is clear that the skipper, an employee of NZKS, failed to comply with his duty through his speed and failure to keep a proper look-out aboard **Te Ika**. However, and for good reasons, section 15 of the HSEA makes employers vicariously liable for their employees' actions:

*Every employer shall take all practicable steps to ensure that no action or inaction of any employee while at work harms any other person.*

110. Case law is clear that any action or inaction of a supervisor is directly attributable to the employer, and that a person apparently in charge of a place of work is not necessarily a person who controls the place of work as defined by the HSEA. In this case the skipper is a NZKS farm manager in charge of the employees, and while he was the skipper of **Te Ika**, his actions and inactions were also the responsibility of NZKS in accordance with section 15 of the HSEA.<sup>2</sup>

111. NZKS also had direct duties under the HSEA as an employer to the two employees on board **Te Ika** that day. Section 6 of the HSEA places a general duty on employers to take all practicable steps to ensure the safety of their employees while they are at work:

*Every employer shall take all practicable steps to ensure the safety of employees while at work; and in particular shall take all practicable steps to—*

- (a) *provide and maintain for employees a safe working environment; and*
- (b) *provide and maintain for employees while they are at work facilities for their safety and health; and*
- (c) *ensure that plant used by any employee at work is so arranged, designed, made, and maintained that it is safe for the employee to use; and*
- (d) *ensure that while at work employees are not exposed to hazards arising out of the arrangement, disposal, manipulation, organisation, processing, storage, transport, working, or use of things—*
  - (i) *in their place of work; or*
  - (ii) *near their place of work and under the employer's control; and*
- (e) *develop procedures for dealing with emergencies that may arise while employees are at work.*

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<sup>2</sup> Refer to case law DOL prosecution, Linework and Andy Kay

112. “All practicable steps” is a key expression that runs throughout the HSEA, and section 2A(1) defines it as:
- (1) *In this Act, “all practicable steps”, in relation to achieving any result in any circumstances, means all steps to achieve the result that it is reasonably practicable to take in the circumstances, having regard to –*
    - (a) *the nature and severity of the harm that may be suffered if the result is not achieved; and*
    - (b) *the current state of knowledge about the likelihood that harm of that nature and severity will be suffered if the result is not achieved; and*
    - (c) *the current stage of knowledge about harm of that nature; and*
    - (d) *the current state of knowledge about the means available to achieve the result, and about the likely efficacy of each of those means; and*
    - (e) *the availability and cost of each of those means.*
  - (2) *To avoid doubt, a person required by this Act to take all practicable steps is required to take those steps only in respect of circumstances that the person knows or ought reasonably to know about.*
113. As discussed throughout this document, steps such as external moderation of all NZKS skippers and those charged with observing and signing them off were clearly practicable. To ensure **Te Ika** was navigated at a safe speed and for a proper look-out to have been kept.
114. These steps are well known to the maritime industry, are readily available, and are not cost-prohibitive.

### **Previous NZKS water taxi related conviction.**

115. In July 2009, NZKS was convicted and fined after pleading guilty to three charges under the MTA and one under the HSEA. This followed the investigation into the collision between the NZKS water taxi **Shikari** and a moored vessel **Flightless** in June 2008. The court ordered NZKS to pay \$265,000 in fines, reparation, and costs.
116. Pertinent to the **Te Ika** investigation are the charges against NZKS under section 6 of the HSEA for failing to take all practicable steps, and under section 65 of the MTA for operating a ship in a manner causing unnecessary danger or risk to other persons.
117. NZKS was found lacking by the courts in the 2009 **Shikari** case for failing to take all practicable steps with regard to speed and look-out. As discussed above, practicable steps were available to NZKS and were brought to their attention as a result of the court ordered sanctions.

### **Immediate post incident action taken by NZKS**

118. NZKS had added the grounding hazard to the hazard register following the grounding of **Te Ika**.
119. NZKS arranged for an electronics supplier to visit **Te Ika** following the grounding incident to assess its equipment. The supplier found that there was no chart or GPS offsets at the time of the grounding. The position was checked and compared to a test GPS and was found to be the same position. The RADAR was checked and sea-trialled and was found to working satisfactorily. Overall the Furuno Navnet was found to be working in both GPS and RADAR modes correctly.

## Findings

120. There were three passengers on board **Te Ika**, two of whom were employees of NZKS. One was a business consultant contracted to NZKS. The vessel was heading to one of the company's salmon farms located at Forsyth Bay in the outer Pelorus Sound. NZKS were also the owners of **Te Ika**.
121. At the time of the grounding, **Te Ika** was being helmed by the Skipper / Farm Manager and of the company. The vessel was travelling at approximately 15 knots, a speed in excess of a speed considered a 'safe speed' due to the restricted visibility at the time. It is clear that the skipper also failed to maintain a proper look-out as he was navigating the vessel by RADAR alone without the use of paper charts or electronic charting software available on the GPS.
122. There was no damage to property or serious harm as a result of this grounding.
123. NZKS vessels and personnel are fully certified to operate within the New Zealand maritime regulatory system. The vessels all hold valid SSM certificates and have been regularly audited and inspected/checked by both MNZ and various SSM Companies. The personnel involved all hold valid maritime qualifications to operate the vessels.
124. NZKS believed that they met all the requirements of that regulatory system, and that their operation was safe and has not been found wanting in any specific areas (such as watchkeeping practises).
125. There is no objective basis by which the company could rely on the expertise of the skippers. The skipper was not fully conversant with the maritime rule requirements for navigating vessels in restricted visibility, despite having completed the restricted RADAR certificate course three months before the grounding.
126. The training and observation programme operated by the company did not provide them with any assurance that the skippers of the vessels remained familiar with the appropriate maritime rules. Despite having no assurance the NZKS routinely relied on their expertise to navigate the vessels.
127. The vessel operation procedures held very little information regarding the safe navigation of the water taxi class vessel, even though this information is readily available in the FishSAFE guidelines. NZKS confirmed that the major role of these vessels is to transit between the berth and the salmon farm.
128. Groundings were not listed as a hazard before this event, even though the vessel travels out of Havelock marina where groundings are possible due to the nature of the Havelock approaches. There are examples in the hazard register of controls and procedures getting mixed up which resulted in the hazard not being controlled.
129. TAIC stated in their **Shikari** report that NZKS had made a number of improvements to their operating system. This investigation has found very little evidence of the changes or how they have made the operation safer.
130. Finally, we note that this accident is similar to the **Shikari** collision, with regard to watchkeeping and safe navigation of water taxis whilst in transit between salmon farms and the berth.

## Recommendations

131. As a result of the above findings, it is recommended that NZKS:
- a) Initiate a regular external moderation program to assess all skippers employed by NZKS, including the Seafarms Manager, for ongoing competency.
  - b) Implement changes to the VOP to include details about the transit phase of water taxi operations.
  - c) Implement changes to the Hazard Register to ensure that all hazards are identified and controlled correctly.
132. As a result of the investigation, the MNZ Safety and Environmental Audit team audited NZKS.

## Post Investigation report action by NZKS

133. A number of amendments have been made to systems and procedures including:
- i) Safe speed added to the VOP
  - ii) Adoption of a policy of all available means for watchkeeping.
  - iii) Low light definitions added to the VOP.
  - iv) Adoption of a biennial remedial training in vessel operations and external moderation.
  - v) Amendments to the hazard register are ongoing.
134. NZKS stated when commenting on the Investigation report that they intend to carry out the 3 recommendations listed.