



**REPORT NO: 01 2774      VESSEL NAME: WAINUI & TOOLKA T**

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## **KEY EVENTS**

### **1.1 EVIDENCE OF TOOLKA T**

**1.1.1** On Thursday 15 November 2001, at approximately 1000 hours NZDT (New Zealand Daylight Saving Time), the sailing vessel **Toolka T** departed Opuia in the Bay of Islands, south bound for Gulf Harbour in Auckland's Hauraki Gulf. On board was the Skipper and three crew members.

**1.1.2** At 2000 hours, sea watches were commenced on board **Toolka T**. These were as follows:

- |    |                    |   |                 |
|----|--------------------|---|-----------------|
| a) | 2000 to 2200 hours | - | Crew #2         |
| b) | 2200 to 2400 hours | - | Crew #2/Crew #3 |
| c) | 2400 to 0200 hours | - | Skipper         |
| d) | 0200 to 0445 hours | - | Crew #1         |

*Recreational craft, such as **Toolka T**, seldom have designated crew positions on board apart from that of Skipper. None of the crew listed above, save for the Skipper, had any positions assigned to them.*

**1.1.3** At 0200 hours, when the yacht was south east of Bream Tail, Crew #1 commenced watch on **Toolka T**, after relieving the Skipper.

**1.1.4** At approximately 0425 hours, whilst on a course of approximately 151° magnetic, 170° True, Crew #1 observed what she described to the Investigators as a "lighted area" dead ahead of **Toolka T**, that subsequently proved to be **Wainui**.

**1.1.5** On monitoring the radar, she noted the echo of **Wainui** was on what appeared to be a reciprocal course to that being steered by **Toolka T**, approximately five to six miles distant. Shortly after 0425 hours, Crew #1 altered course 5° to starboard, with the intention of passing port to port with **Wainui**.

**1.1.6** As both vessels continued to close, Crew #1 determined that **Wainui** did not appear to alter course to starboard. For this reason, she made a further alteration of 20° to starboard, still with the intention of passing port to port. Crew #1 could not recall the time she altered course or the distance between the two vessels at this juncture.

**1.1.7** After completing the two course alterations, Crew #1 observed what subsequently proved to be the green sidelight of **Wainui**. Shortly afterwards, she determined by visual observation, that **Toolka T** would not pass clear of **Wainui**. Accordingly, she put the helm to port and made an alteration of course of approximately 45° until **Toolka T** was on what appeared to be a broadly reciprocal course to that being steered by **Wainui**. At this point she steadied the course of the yacht. Shortly afterwards, **Toolka T** passed **Wainui** starboard to starboard.

- 1.1.8** After the stern of **Wainui** had passed clear of the yacht, Crew #1 altered course to starboard and back to her original course of approximately 151° magnetic. At this time, she was unaware that the barge **Sea -Tow 11** was in tow behind **Wainui**. As **Toolka T** crossed astern of **Wainui**, its keel became fouled in the submerged tow line between **Wainui** and **Sea -Tow 11**. As a result, **Toolka T** started to lose way as the tow line slid along its keel.
- 1.1.9** Immediately on the yacht losing headway, Crew #1 shouted for assistance from the other persons on board, and was joined on deck by Crew #2. He observed **Toolka T** was 'bow on' to **Sea -Tow 11** and that a collision was imminent. He switched off the auto pilot, and attempted manually, by putting the helm hard to port, to steer **Toolka T** clear of **Sea -Tow 11**. Crew #3, who was in the companionway, below deck, was of the opinion that he changed to manual steering and put the helm to port before making any assessment of the situation.
- 1.1.10** Within seconds of Crew #2 applying full port helm, **Toolka T's** starboard bow struck the bow of **Sea -Tow 11**, at an angle of approximately 60° leading aft on the barge. Within a few seconds of the collision occurring, **Toolka T** sank beneath the barge, (*See Appendix 1 – Copy of Chart NZ52 Cape Brett to Cuvier Island, from **Wainui**, noting collision and position*).

## **1.2 EVIDENCE OF WAINUI & SEA TOW 11**

- 1.2.1** On Friday 16 November, at approximately 0030 hours, the tug **Wainui** departed Wynyard wharf in Auckland harbour, with the barge **Sea -Tow 11** in tow, north bound for Pakiri. On board was the Skipper and four crew members. **Wainui** operated within Auckland Enclosed Limits on a "short towline" of approximately 75 metres. The full tow line (usually about 450 metres) was not run out until the tug and tow were clear of 'A' buoy (marking the seaward boundary between Auckland Enclosed Limits and Auckland Inshore Limits).
- 1.2.2** At 0100 hours, sea watches were commenced on board **Wainui**. These were as follows:
- |    |                    |   |                            |
|----|--------------------|---|----------------------------|
| a) | 0100 to 0220 hours | - | Master, Engineer & Crew #1 |
| b) | 0220 to 0320 hours | - | Engineer                   |
| c) | 0320 to 0435 hours | - | Crew #2                    |
| d) | 0435 to 0445 hours | - | Crew #3                    |
- 1.2.3** At approximately 0230 hours, as **Wainui** and her tow continued northbound, it passed the southbound dredger **Coastal Carrier** in the Whangaparoa Passage, situated between the Whangaparoa Peninsula and Tiritiri Matangi Island. The relieving Master aboard **Coastal Carrier** observed that the correct navigational lights were being displayed on both the tug and barge at this time.

- 1.2.4** At 0320 hours, Crew #2 commenced his watch on board **Wainui**, when they were in a position approximately halfway between Tiritiri Matangi and Kawau Islands (*See Appendix 1*). Shortly before his watch was due to finish at 0435 hours, Crew #2 first observed what subsequently proved to be, the green sidelight of **Toolka T** on **Wainui's** starboard bow on a relative bearing of approximately 30° to 40°. On checking the radar and observing the echo of **Toolka T**, Crew #2 determined it to be just under one mile distant and estimated that it was slow moving. As **Toolka T** drew closer to **Wainui**, he saw it was also exhibiting a dim single white masthead light.
- 1.2.5** Shortly before waking the relief watchkeeper, Crew #2 observed **Toolka T** was approximately ½ a mile distant. After leaving the bridge to wake the relief watchkeeper, Crew #2 returned to the bridge and observed that the green sidelight and the white masthead light were still bearing broadly on the starboard bow. He was not concerned about the safety of the yacht at that point as it appeared to be on a heading that would take it well clear of both the tug and the tow.
- 1.2.6** When Crew #2 first observed **Toolka T**, he monitored its distance from **Wainui** on the radar, but did not plot the vessel or take any compass bearings to determine accurately if risk of collision existed. He was, however, based on a visual assessment of her navigation lights, satisfied that the bearing of **Toolka T** was changing and that risk of a collision did not exist. He stated that had he considered a risk of collision to exist, he would have altered course to ensure a port to port passing and/or call the Master. At his watch hand over, he did not advise his relief of the position, course or speed of **Toolka T**.
- 1.2.7** At 0435 hours, Crew #3 relieved Crew #2 of his watch. At this time, **Wainui** was off Takatu Point on the Tawharanui Peninsula (*See Appendix 1*). Crew #3 stated he observed the white masthead light of **Toolka T** on **Wainui's** starboard bow at an angle of approximately 45°. Between about ½ minute and one minute of commencing his watch, Crew #3 made a course alteration of approximately 10° to port, with the intention of ensuring that **Toolka T** and **Wainui** passed each other starboard to starboard. Crew #3 continued to observe the lights on **Toolka T** and determined its relative bearing was opening and that it was moving clear down **Wainui's** starboard side. He believed **Toolka T** was approximately 150 metres to starboard when it passed abeam of **Wainui**. Crew #3 estimated this distance by observing the brightness of the white masthead light and the height of this light relative to the horizon.
- 1.2.8** When Crew #3 first saw the white masthead light on **Toolka T**, he glanced at the radar and knew that it was close. He was concerned there might be a risk of collision because of near proximity of **Toolka T**. Crew #3 said that he never took his eyes off **Toolka T** and that he "..... was trying to identify a port and starboard light off it, you know, just to see which, which direction the boat was heading in." He thought the yacht would be alright as **Toolka T** passed abeam of **Wainui**, but then had a 'funny feeling' that it was going to go behind the tug. After clearing the stern of **Wainui**, he saw the yacht make a starboard turn and could not believe what he was seeing. He then saw the green sidelight of **Sea -Tow 11** become obscured by the yacht as it continued to cross astern of the tug. Immediately on observing that **Toolka T** was in the path of **Sea -Tow 11**, he attempted to reduce power by putting **Wainui's** engine in neutral, in the hope that the tow line would sink and allow **Toolka T** to pass clear. However, Crew #3 was somewhat in a state of panic at this stage and did not make any positive control

changes, although he apparently knew how to. In the first interview conducted by the Investigator, he stated that he had never touched the controls before. Subsequently, however, he said he was familiar with the controls but that they were quite hard to pull back. Crew #3 said it was not normally his job to make engine adjustments and ordinarily he would have called the Master to assist but due to the unexpected turn to starboard by the yacht and because of the lack of time, he was unable to do so. Crew #3 was stated to have operated the 'Morse' controls for the sandpump engine on the barge **Pohonui** for three months. These were reported to be "virtually identical" to those on **Wainui**. (See Appendix 2 – Photo 10 – Starboard view astern from bridge of **Wainui**).

- 1.2.9** When **Toolka T** struck the steel bridle and bow of **Sea -Tow 11**, Crew #3 saw a number of sparks and then saw **Toolka T** sink. The Investigator found aluminium embedded in the steel bridle and observed scrape marks on the starboard section of the bow. It is probable that this aluminium came from the aluminium mast of **Toolka T** and the sparks from the stainless steel rigging striking the steel towing bridle, (See Appendix 2 – Photo 11 – Aluminium embedded in bridle) and (See Appendix 2 – Photo's 12 to 15 – bow of **Sea Tow 11** with scrape marks).
- 1.2.10** On observing the collision, Crew #3 immediately called the Master and crew. **Wainui** circled the area of collision and commenced searching for survivors with the aid of a spotlight.
- 1.2.11** At approximately 0455 hours, three survivors were sighted in the water and brought on board **Wainui**. They advised that the Skipper of the yacht was missing.
- 1.2.12** At approximately 0500 hours, the Master of **Wainui** called Auckland Maritime Radio advising there had been a collision and advised his position.

### **1.3 SEARCH & RESCUE**

- 1.3.1** At 0509 hours, the Maritime Safety Authority (MSA) and North Comms (Police Communications) were advised of the accident.
- 1.3.2** At 0510 hours, a Mayday relay was broadcast on Great Barrier, Auckland and Plenty radios on VHF channel 16.
- 1.3.3** At 0520 hours, Auckland Coastguard was advised of the accident and Kawau Coastguard was contacted to dispatch rescue craft to the area.
- 1.3.4** At 0528 hours, Police dispatched the Westpac rescue helicopter to the area.
- 1.3.5** At 0529 hours, the Naval survey vessel, **Resolution**, notified the Maritime Operations Centre (MOC) that they were one hour from the scene of the accident.
- 1.3.6** At approximately 0603 hours, Kawau Coastguard rescue craft arrived at the search area.
- 1.3.7** At 0639 hours, **Resolution** commenced searching for the wreck of **Toolka T**.
- 1.3.8** At 0715 hours, **Wainui** left the search area after being released from search duties.

- 1.3.9** At 0810 hours, **Resolution** located the wreck of **Toolka T** in 49 metres of water.
- 1.3.10** At 1550 hours, MOC were advised by the Police that navy divers off the naval vessel **Kahu** had recovered the body of the Skipper from the vicinity of the wreck of **Toolka T**.

## KEY CONDITIONS

### 2.1 PARTICULARS OF TOOLKA T & CREW

**2.1.1 Toolka T** was a 13 tonne, 11.28 metre Joubert design, glass reinforced (GRP) sloop, built in Australia in 1979. It was powered by a 33kW Volvo diesel motor. The vessel's home port was Adelaide and it was registered as an Australian ship. It was a member of the Island Cruising Association of New Zealand. This required members to comply with Category 1 safety standards as laid down by Yachting New Zealand (YNZ). YNZ had no record of **Toolka T** having undergone a Category 1 inspection in New Zealand. The liferaft did surface after the yacht sank but did not inflate (the reason for this is unknown) and accordingly could not be utilised by the survivors. The liferaft was never recovered and is presumed to have sunk. Apart from other safety equipment, a triangular shaped alloy radar reflector was fitted on the aluminium mast below the radar scanner at a height of approximately 5-6 metres above sea level. The manufacturers of a radar reflector, that was of a similar construction and size to that fitted on **Toolka T**, stated that at a height of about 6 metres above sea level, its detectable range would be in the order of 5-6 miles.

**2.1.2 Toolka T** had a deep steering station cockpit. A fixed dodger and bimini cover were located forward of the steering station. A dinghy was tied down to the top of the couch roof in front of the fixed dodger. One crew member stated that for these reasons, visibility forward on the yacht was restricted. The helmsperson on **Toolka T** stated she had to look over these obstructions to see ahead properly.

**2.1.3** The Skipper of **Toolka T** was reported to be a very experienced blue water yachtsman, with 110 000 miles of cruising, whilst Skipper of **Toolka T**. He was highly regarded in the yachting community as a competent Skipper. Family members of the Skipper and sailing associates could not state if he held any maritime qualifications. His son thought that he may have completed a radar course through the Royal South Australian Yachting Squadron.

**2.1.4** The helmsperson (Crew #1) aboard **Toolka T** had 27 years experience crewing on coastal and offshore sailing vessels. Crew #1 stated that she was short sighted and, whilst able to see lights at night, had difficulty distinguishing different lights from one another at a distance. The Skipper was aware of this and knew that her glasses were broken. She was able, however, to clearly see Cape Rodney light and the light on Flat Rock, east of Kawau Island, shortly before the collision occurred. She never saw the hull outline of **Sea -Tow 11** until **Toolka T** struck the towline. When questioned by the Investigators, she said she did not know what the correct lights were for a tug with a tow. As **Toolka T** passed **Wainui**, Crew #1 saw it was exhibiting other lights apart from its starboard sidelight, but did not know what they signified. At the time, she assumed she was passing a fishing vessel. In December 2001, Crew #1 underwent a full visual and refraction examination. Visual occutities were diagnosed in both eyes at 6/21 and 6/30 without corrective lenses. This level of vision, without corrective lenses, was below that required for commercial marine requirements; there are no requirements laid down for a minimum level of vision on board recreational craft, such as **Toolka T**. Her colour vision was normal. Crew #1 has advised that she intends to ensure that she is wearing glasses if she is again acting as a helmsperson.

#### **Navigation of Toolka T**

- 2.1.5** The Koden radar on **Toolka T** was set on the eight mile range scale . Crew #1 was able to determine **Wainui's** distance from **Toolka T** by noting its position in relation to the one mile range rings. The radar screen was clear and set on the relative motion display with the heading marker pointing to the top of the screen (*ship's head up*). She stated that **Wainui** and its tow appeared as a single echo on the radar screen. She never altered the settings on the radar as she did not know how to do this.
- 2.1.6** Crew #1 did not know how to plot the course and speed of another vessel, using the radar. She did not plot the course made good by the yacht on the chart during her watch. She did, however, usually chart a single position from the Global Positioning System (GPS) at the end of her watches. She did not know how to use a compass to take bearings. Crew #1 referred to the GPS chart plotter and not the paper chart for navigational purposes during her watch. Crew #1 had crewed on **Toolka T** for 10 years and had carried out regular watches during that time. She knew some of the Collision Rules, but did not have an extensive knowledge of them.
- 2.1.7** The crew on **Toolka T**, including Crew #1, had all been told by the Skipper to call him if a close quarters situation was developing or if they were concerned at any stage for the safety of the yacht.
- 2.1.8** With the exception of when Crew #2 attempted to manually steer clear of **Sea -Tow 11** just before impact, **Toolka T** was steered by autopilot, including the period during Crew #1's last watch.

#### **Navigation Lights on Toolka T**

- 2.1.9** At the time of the accident, **Toolka T** was motor sailing and displaying a white masthead light, red and green sidelights and a white stern light in accordance with Part 22 of the Maritime Rules – Collision Prevention.

Under Appendix 1 – “*Positioning and Technical Details of Lights and Shapes*”, of Part 22 of the Maritime Rules, is sub-heading (2)(4), which states, amongst other things:

*“that where a masthead light is carried in addition to sidelights and a sternlight, then such a masthead light must be carried at least one metre higher than the sidelights”.*

The positioning of the white masthead light, about 4 metres up the mast of **Toolka T** (which was in excess of 1 metre above the sidelights), was in accordance with the above rule.

- 2.1.10** **Toolka T** had the following navigation light switches:

- o “Nav. 1” –For the tri-colour lantern on the top of the mast, whilst proceeding under sail only.



departing at midnight when weather conditions permitted dredging operations. The southern limit of the dredging area was situated 47.6 nautical miles from Auckland. **Wainui** was on a regular run between Auckland/Pakiri/Auckland.

- 2.2.6** The Master of **Wainui** held a Master Small Home Trade Certificate, issued in 1979 by the Ministry of Transport (MOT). In addition, he held a “Certificate of Local Knowledge for a Master of a Tug Boat under 100 Gross Tonnes, Operating Within the Auckland Pilotage District”. This was issued in 1979, by the Auckland Regional Council (ARC). He was the relief Master aboard **Wainui** and had 27 years experience of working on tugboats. As the relief skipper, he had completed 48 trips on **Wainui** in 2001, and 26 trips the previous year and consequently was experienced with operation of the vessel, its equipment and crew. During his time on tugboats, he had not had an accident or mishap. His navigation and seamanship in accurately retracing his course at night and rescuing the three survivors from the yacht is to be commended.
- 2.2.7** Crew #3 held a Marine Operators Certificate, which he obtained in Australia in 1988. He could not recall being taught anything about the Collision Rules when he attended that course. He had five years experience working on tugs and had worked for the Company for three months. He had completed approximately 50 watches on board **Wainui**. Crew #3 had six years experience on large ships. This included bridge lookout duties.
- 2.2.8** Crew #2 had worked on **Wainui** for over five years and did approximately 50 to 80 trips per year to Pakiri on this vessel. Additionally, he did another 30 to 40 trips each year on **Barbara W** within Auckland Enclosed Limits. Crew #2 had 30 years experience on tug boats on the New Zealand coast. He held no maritime qualifications.
- 2.2.9** The Master expressed his concern to Crew #3 that he had not called him before the accident. He said he required his crew to read the SSM Manual and if they were not sure of anything contained in it, it was explained to them. In particular, he had been through the standing orders with both watchkeepers and in his opinion both of them were fully aware of those orders. All crew were told to call him if they were unsure what a vessel was going to do if it was within a mile of **Wainui** and stated, “*on the **Wainui** you only got, you know, press a button and I am up there straight away*”. At a combined closing speed of about 13 knots (see paragraph **2.2.20**), it would have taken about 4½ minutes to cover a distance of one nautical mile, the approximate distance at which Crew #2 first observed **Toolka T**.
- 2.2.10** The Master stated all watchkeepers were familiar with the switches operating the lights on deck and that they should have been able to instantly operate the horn to warn other vessels. Further, to his knowledge all the watchkeeping crew could use the bridge controls in an emergency. The Master said he encouraged his watchkeepers to use the VHF before calling him and that they were familiar with its operation.

**2.2.11** Crew #2 said he had signed the SSM manual to confirm that he had read its contents but that he had not read it thoroughly. He stated, however, that he understood his responsibilities as a watchkeeper. He had never used the intercom button to call the Master in an emergency or used the VHF to establish the intentions of another vessel. He indicated that he would call the Master if he was unsure of another vessel's intentions.

### **Navigation Lights of Wainui and Sea Tow 11**

**2.2.12** At the time of the accident, **Wainui** was displaying the correct navigational lights for a towing vessel, where the length of tow exceeds 200 metres, in compliance with Rule 22.24. These were:

- (a) *three white masthead lights in a vertical line*
- (b) *red and green sidelights*
- (c) *a white sternlight*
- (d) *a yellow towing light in a vertical line above the sternlight*

Rule 22.22, "Visibility of Lights" requires, for a vessel the size of **Wainui**:

<i>masthead light</i>	-	<i>3 miles</i>
<i>sidelight</i>	-	<i>2 miles</i>
<i>sternlight</i>	-	<i>2 miles</i>
<i>towing light</i>	-	<i>2 miles</i>

**2.2.13** At the time of the accident, **Sea -Tow 11** was displaying red and green sidelights and a white stern light in accordance with Maritime Rule 22.24(4). The sidelights were located on top of the deckhouse at the bow of **Sea -Tow 11**. They were required to have the same visibility as those listed in paragraph **2.2.12** above.

**2.2.14** The navigation lights on **Sea -Tow 11** were primarily charged by an 80 amp battery charger, run from a diesel powered 175 kva genset. During daylight hours, the lighting batteries received additional charges from two 83 watt solar panel lights. The switchboard had manual and automatic switches to power these lights. In the event of a navigational light failure, the automatic backup lights were activated. (See Appendix 2 – Photo 7 – Switchboard)

**2.2.15** As **Toolka T** passed abeam of **Wainui**, the helmsperson on **Toolka T** kept observing **Wainui** to determine when it was safe to alter course across the stern of the tug. For this reason she was not keeping a proper lookout for another vessel. There can be no doubt that the lights of **Sea -Tow 11** were visible at that time. The crew member who managed to reach the deck of **Toolka T** shortly before the collision, saw both port and starboard lights of **Sea Tow 11** burning brightly as the barge bore down on the yacht.

**2.2.16** At the time of the collision, **Wainui** was displaying the lights of an ordinary power driven towing vessel with a duty to alter course to starboard for a power driven vessel on a reciprocal or nearly reciprocal course and to keep out of the way either for a power driven vessel crossing on her own starboard side or for a fishing vessel, providing risk of collision existed. She was not displaying the lights for a vessel that was restricted in its ability and its tow to deviate from their course, in which case a power driven vessel was required to keep out of her way and, so far as possible, a fishing vessel. If **Wainui** and its tow had been restricted in its ability to deviate

from their course then, in addition to the lights specified in paragraph **2.2.12** of this report, **Wainui** would have been required to display three all round lights in a vertical line where they could best be seen, the highest and lowest being red and the middle light white. However, given Crew #1's unfamiliarity with towing lights, it is not considered likely that the exhibition of these additional lights would have prevented this accident. For the purpose of interpreting the Collision Prevention Rules, **Wainui** and **Sea -Tow 11** are deemed to be a single vessel.

**2.2.17** After the accident, the Investigator observed **Wainui** and **Sea -Tow 11** whilst underway at night, in similar weather conditions. The sidelights of both tug and tow and the towing lights of **Wainui** were observed to be burning brightly at a distance of over three miles, in accordance with the requirements of Rule 22.22, (See paragraph 2.2.12).

### Navigation of Wainui

**2.2.18** The chart on the bridge of **Wainui** was chart NZ52, Cape Brett to Cuvier Island, (See Appendix 1). The Master had previously plotted the course on the chart as the preferred course to be taken on the regular runs to Pakiri. If **Wainui** was steering a course of 315° (T), as plotted on the chart, then the relative bearing of **Toolka T** on a course of 170° (T), would have been approximately 35° on **Wainui's** starboard bow. It cannot be positively established however, that **Wainui** was steering a course of 315° (T), as neither of the two watchkeepers was able to confirm what course they were steering before the collision. Maintenance of the course of the tug and tow was obtained by visual observation of the coastline and the use of radar.

**2.2.19** The radar on **Wainui** was set to relative motion display with fixed one mile range rings. Some doubt existed as to the range scale of the radar at the time the collision occurred. The watchkeeper at the time of the collision, when first interviewed, stated it was four miles, but in a subsequent interview, stated it could have been different and that the normal setting was either four or eight miles. The other watchkeeper thought the radar was on the eight mile range scale.

**2.2.20** **Wainui** was travelling at a speed of 7.9 knots before the accident. **Toolka T** was motor sailing at approximately five knots.

**2.2.21** Crew #2 stated that after waking Crew #3, he believed, from observing **Toolka T's** green starboard sidelight, that it would pass astern of **Sea -Tow 11**. He stated, *"my thought then, he was coming in, and would have to take a clean cut behind the barge"*.

**2.2.22** When Crew #3 first saw **Toolka T**, he believed there was a risk of collision because **Toolka T** was so close. He altered course to port by approximately 10° because he felt the vessels were too close. This action was taken without knowing the course of the yacht; he saw only a single white masthead light bearing about 45° on his starboard bow. He did, however, deduce before altering course to port, that the bearing of the yacht was opening to starboard. He initially thought he saw port and starboard sidelights, but later could not see any sidelights when he altered course or as the yacht passed down his starboard side. He stated, *"I thought I saw a port and starboard light (together)"*. He further stated, *"that's why I made a 10° change to port to indicate my starboard light that we were going, I was going to port and we could pass on the starboard side"*. Crew #3 did not consider calling the Master at any stage before **Toolka T** hit the tow line. This was despite being uncertain of the

intentions of **Toolka T** and knowing he had an obligation to call the Skipper in such a situation. He was aware of the additional requirements in the standing orders, but stated that events took place too quickly for him to act on those requirements.

**2.2.23** Compass bearings of other vessels were seldom, if ever, taken by either Crew #2 or Crew #3 to establish if a risk of collision existed. Crew #2 said he had not called the Master or used the VHF to warn the yacht because from his observation of the lights on **Toolka T** and the fact that their bearing was opening, he did not consider there was a risk of collision.

**2.2.24** When questioned by the Investigators, the other watchkeeper, Crew #3, displayed a lack of knowledge of matters pertaining to safe watchkeeping. Whilst he professed to be a competent watchkeeper, he was not sufficiently familiar with the operation of the bridge controls to be able to use them quickly in an emergency. Nor did he appear sufficiently familiar with the location of the button for the bridge horn to be able to sound this immediately in an emergency, or to operate the switches for the spotlight or the tow line floodlights. This is in direct conflict with the statements of the Master in paragraph **2.2.10** of this report. Whilst he stated having some knowledge and experience with the Collision Regulations he did not know them sufficiently to know which vessels were required to 'give way' to others and which vessels were required to 'stand on'.

### **Weather Conditions**

**2.2.25** The weather conditions were fine and clear with excellent visibility. The wind was light from the southwest with corresponding slight seas. There was no moonlight; the moon was due to rise at 0538 hours. The crew on both vessels stated the outline of headlands and shore navigational lights were clearly visible. The Investigator found the visibility from the bridge of **Wainui** to be good (See Appendix 2 – Photo's 8 & 9 – Bridge of **Wainui** forward).

### **Maritime Rules – Collision Prevention**

**2.2.26** Maritime Rule 22.5 – Lookout, states:

*"Every vessel must at all times maintain a proper lookout by sight and hearing as well as by all means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision."*

It is well established that the term 'proper lookout' includes the effective use of all available instrumentation and equipment, in addition to both sight and hearing. This applies particularly to radar. As **Toolka T** sank, there was no means by which the luminosity of her lights could be tested to determine the distance at which they should have been observed by those on board **Wainui**, if a proper lookout was being maintained. Crew #2 states observing the green sidelight of **Toolka T** first and then going to the radar to determine its distance, which was just under one mile; one mile was the minimum range of visibility for such a light. There is, however, no evidence to suggest that the echo of the yacht at this time was difficult to observe on the radar screen. On this basis and given that the yacht was fitted with a radar reflector, the echo of **Toolka T** should have been observed earlier, if a proper lookout was being maintained, thereby giving more time in which to determine whether there was risk of collision. Use of VHF would be included among 'all means appropriate' in the rule and if it had been utilised in this instance,

to identify the fact that there was a tug and tow, it might have prevented the collision.

As **Toolka T** sank, there was no means of ascertaining the clarity of the picture on her radar screen. However, if the control settings of a radar are set properly, it would normally be possible to differentiate the echoes of a tug and tow.

Crew #1 admitted that she was concentrating on **Wainui** to determine when it would be safe to alter course around her stern and for this reason did not look ahead at this time or subsequently after altering course to starboard. However, the sidelights on **Sea Tow 11** would have been visible long before this time if a proper lookout had been maintained. Accordingly, there can be no question that the standard of lookout on **Toolka T** was deficient and in breach of the above rule.

**2.2.27** Rule 22.7 – Risk of Collision, states:

*" (1) Every vessel must use all available means appropriate to the prevailing circumstances to determine if risk of collision exists. If there is any doubt such risk shall be deemed to exist.*

*(2) Proper use must be made of radar equipment if fitted and operational, including long range scanning to obtain early warning of risk of collision and radar plotting or equivalent systematic observation of detected objects.*

*(3) Assumptions must not be made on the basis of scanty observation, especially scanty radar information.*

*(4) In determining if risk of collision exists the following considerations must be among those taken into account:*

*(a) such risk may sometimes exist if the compass bearing of an approaching vessel does not appreciably change;*

*(b) such risk may sometimes exist even when an appreciable bearing change is evident, particularly when approaching a very large vessel or a tow or when approaching a vessel at close range.*

There is no evidence to suggest that Crew #2 utilised long range scanning techniques and plotting to obtain early warning of risk of collision. His opinion that there was no risk of collision was based on scanty information, both visually and by radar and at a time when he had no information as to the course or speed of **Toolka T** or its closest point of approach (CPA) to the tug and the tow. Moreover, Crew #2 should have been aware of the caveat in Part 22.7(4)(b) above namely, that risk of collision can still exist even where there is an appreciable bearing change. His evidence is at odds with that of Crew #3, who was concerned there might be a collision as **Toolka T** was close and who, at one stage, thought he saw her red and green sidelight together. The fact that the eventual CPA was in the order of only 150 metres (after an alteration of course to port by **Wainui**), is testimony to the mistake that Crew #2 made in assuming that there was no risk of collision and therefore did not need to call the Master or warn the approaching vessel of the identity of the tug and tow over the VHF.

Crew #1's decision to alter course to starboard, initially by 5° and then by a further

20°, was based on observing a "lighted area" ahead and on scanty radar information in direct breach of Maritime Rule 22.7(3). She admitted being unable to plot the course and speed of another vessel using the radar and yet, without having precise details of either, elected to alter course on two separate occasions to starboard. The subsequent alteration of 45° to port, onto a course that appeared to be broadly reciprocal to that being steered by **Wainui** was made without knowing what the closest point of approach would be to that vessel.

Further, as Crew #1 was unable to determine the identity of the lights being exhibited by **Wainui**, she should not have assumed it was a fishing vessel but should have sought the assistance of the Skipper for guidance on this issue. Crew #1 stated that she delayed her alteration of course to starboard, across the stern of **Wainui**, as she thought it was a fishing vessel with gear in the water.

**2.2.28** Maritime Rule 22.15 - Crossing Situation, states:

*"When two power driven vessels are crossing so as to involve risk of collision, the vessel which has the other on her own starboard side must keep out of the way and must, if the circumstances of the case admit, avoid crossing ahead of the other vessel."*

**Toolka T**'s original steered course of approximately 170°(T), was followed by course alterations of 5° and 20° to starboard and then about 45° to port. If correct, this would have put her on a course of about 150°(T) at the time she passed down the starboard side of **Wainui**. If **Wainui** was steering a course of 315°(T), this would mean that there was a crossing situation at a 'fine closing angle' of about 15°. As the CPA between the two vessels was only about 150 metres, it is considered there was a risk of collision, with the duty on **Wainui** to keep clear of **Toolka T** in accordance with this rule. Any avoiding action at such a close distance, however, without knowing the course, speed or CPA of **Toolka T** was dangerous. It was imperative therefore, in the absence of such information, to sound at least five short and rapid blasts on the whistle, to attempt to raise the yacht on the VHF and to identify the tow by means of the searchlight so as to minimise the risk of collision.

### **Maritime Rules – Manning**

**2.2.29** It was the responsibility of the Master and the operator of the vessel to ensure persons on watch were able to operate the vessel safely. Maritime Rule 31B – Crewing and Watchkeeping on Offshore, Coastal and Restricted (Non- Fishing Vessels), which came into force on 1 February 2001 states, amongst other things in section 31B.8, that there must be sufficient crew to maintain safe navigational watches and that in applying the requirements of this section the owner and the master must take into account the requirements of the Maritime Transport Act 1994 and any maritime rules covering matters such as watchkeeping, training of seafarers and safety management. Further, under section 31B 6 (4), it states that the owner and the master of a vessel **must monitor on an on-going basis** (our emphasis), the effectiveness of crewing ..... in order to ensure compliance with Rule 31B 8. Under section 31B 8, the owner and the master were required to establish and implement watchkeeping procedures addressing, amongst other things, the fitness for duty of watchkeepers; navigation planning and duties; the use of navigational equipment and lookout duties. It was clear that whilst all these matters were addressed in the SSM manual, that the Master and crew failed to comply with many

of its requirements. (See Appendix 4 – Copies of pages from the SSM manual for **Wainui**).

Requirements that were not complied with, were as follows:

a) When interviewed by the Investigator, Crew #3 stated he had “*looked through*” the SSM manual but did not appear familiar with its contents when questioned further. When asked what he would do in a situation when he was unclear of another vessel’s intentions, he said he would call the Master before carrying out the steps required by the standing orders posted on the bridge. Crew #3 had signed an acknowledgement that he had read and understood the SSM manual on board the other company tug **Barbara W**, which was identical in content to that on board **Wainui**. All the crew listed in paragraph 1.2.2 above had signed this acknowledgement in either **Wainui**’s or **Barbara W**’s SSM manuals.

b) The Master’s responsibilities and authority were listed on page 12 of the manual. These included:

*i) the safe and efficient navigation of the vessel.*

*ii) the training of the crew.*

*iii) compliance with the Maritime Transport Act, Regulations and Maritime Rules*

c) One section, on the resources and personnel, on page 13, stated:

*i) “new personnel shall be carefully trained in their duties. The vessel’s Master is responsible for this training and new personnel shall not be allowed to undertake a wheel watch unsupervised until the Master is confident that the person is familiar with the courses and capable of competent watchkeeping”.*

d) The Code of Practice for tugboat operations, on page 19, stated:

***“Crew on watch to call Master immediately if they are unsure of a nearby vessel’s course or intentions”*** (our emphasis).

e) The Standing Orders for Navigational Watchkeeping, on page 41, a copy of which was posted on the bridge of **Wainui**, stated:

*i) “The watchkeeper is responsible for the safe navigation of the vessel at all times, with particular care to avoid collision or stranding in accordance with the regulations”.*

ii) ***“The Master should be summoned immediately if the watchkeeper has any doubts regarding the other vessel’s close proximity”***, (our emphasis) and further, *“if the Master is to be called, it shall be with sufficient warning to allow corrective action to be taken. A Captain’s alarm is situated in the wheelhouse to allow the watchkeeper to call for assistance without leaving his station”*.

iii) *“Any vessel approaching within two nautical miles by day, or four nautical miles by night, should be contacted by radio and made aware of the tow and the limitations of the tug and barge, if the watchkeeper is unclear of the intentions of the other vessel. If radio contact is not possible, all other means shall be made to alert the other vessel, including a foghorn (five sharp, rapid blasts) spotlight and tow line floodlights”*. Crew #2 maintained that as he was aware of the intentions of the yacht, there was no requirement for him to alert the yacht of the identity of the tug and tow. However, for the reasons set out under the sub-section 'Maritime Rules – Collision Prevention', it is considered that there were insufficient grounds for him to reach this conclusion.

**2.2.30** The statements given by the crew of **Toolka T** suggested they were fortunate to survive. One stated that after the collision, he struck the hull of **Sea -Tow 11** twice whilst attempting to swim to the surface, receiving injuries from the barnacles on the bottom of the hull. On the third attempt, he believed he would be killed by the propeller of what he thought was a ship that had run over **Toolka T**, but surfaced safely astern of the barge. Another stated she remained in **Toolka T**, at the entrance to the companionway, fearing injury as the mast was coming down after the collision. Despite the noise and shouting, she observed that the Skipper did not move from his bunk at any stage. She was forced to remain in the yacht as it sank by the force of water ingress through the companionway. She was only able to swim clear as the yacht was sinking and the pressure had eased sufficiently to allow her to swim out through the companionway. She stated she was underwater for a considerable period and was exhausted by the time she reached the surface. The survivors were able to swim together and clung to a fender until rescued by **Wainui**.

**2.2.31** Conflicting accounts and imprecise times make reconstruction of the events difficult. Accordingly, the track of the vessels in relation to one another can only be estimated. Based on statements by the helmsperson aboard **Toolka T** and watchkeepers aboard **Wainui**, the Investigator has completed two sketches, detailing the stated tracks of both vessels, in relation to one another, up to the point of impact (*See Appendix 5 – Sketches by Investigator*).

## **CONTRIBUTING FACTORS**

*N.B – these are not listed in order of importance*

### **3.1 WAINUI**

- 3.1.1** The failure to determine at an early stage, that risk of collision existed.
- 3.1.2** The failure of the watchkeeper to operate the controls and reduce speed to increase the catenary of the tow line.
- 3.1.3** The failure of the watchkeeper to operate the horn, spotlight or tow line floodlights to warn **Toolka T** that it was running into danger.
- 3.1.4** The failure to call the Master at a time when the watchkeepers were unaware of the course, speed or CPA of **Toolka T**.
- 3.1.5** The failure of the Master and Owners to ensure that all watchkeepers were fully compliant with the following:
  - a) Knowledge of the Collision Rules.
  - b) Sufficiently familiar with the engine throttle and gear controls to be able to operate them quickly in an emergency.
  - c) Sufficiently familiar with the operation of the horn, spotlight and tow line floodlights to be able to utilise them immediately in emergency situations.
  - d) Knowledge and application of the requirements of the SSM manual.
- 3.1.6** The failure to contact **Toolka T** on VHF channel 16, in breach of the standing orders.
- 3.1.7** The failure of the Master and watchkeepers to comply with the safety requirements of the SSM manual.
- 3.1.8** The failure to keep a proper lookout, both visually and by radar, in breach of Maritime Rule Part 22.5.
- 3.1.9** The failure to sound five short rapid blasts, as required under Rule 22.34(3) of the Collision Rules. This is required when:
  - a) Either fails to understand the intentions or actions of the other.
  - b) If there is doubt whether sufficient action is being taken by the other to avoid collision.
- 3.1.10** The lack of knowledge of the Collision Rules.

## **3.2 TOOLKA T**

- 3.2.1** The inability of the helmsperson to identify **Wainui** as a towing vessel, with a tow in excess of 200 metres.
- 3.2.2** The failure of the helmsperson to call the Skipper:
  - a) For guidance, when she was unsure of the identity of the lights exhibited by **Wainui**.
  - b) As soon as it became apparent that a close quarters situation with **Wainui** was developing.
- 3.2.3** The failure of the watchkeeper to keep a good all round lookout instead of concentrating on the tug **Wainui**.
- 3.2.4** The failure of the helmsperson to contact **Wainui** on VHF channel 16 when she was unsure of its intentions.
- 3.2.5** The failure to sound five short, rapid blasts, as required under Rule 22.34(3) of the Collision Rules.
- 3.2.6** The decision of the helmsperson to alter course to starboard after clearing the stern of **Wainui**.
- 3.2.7** The lack of knowledge of the Collision Rules by the helmsperson on **Toolka T**.
- 3.2.8** The decision of the Skipper to leave a helmsperson in charge of a watch, whose eyesight was known to be impaired and whose lack of knowledge of the identity of navigational lights rendered it unsafe for her to keep a watch by herself, particularly in coastal waters where close quarter situations with other vessels was likely to occur.

## CAUSE

### **Human Factor**

v Failure to comply with regulations	o Drugs & Alcohol	o Overloading
v Failure to obtain ships position or course	o Fatigue	o Misconduct/Negligence
v Improper watchkeeping or lookout	o Physiological	o Error of judgement
v Lack of knowledge	o Ship Handling	o Other . . .

### **Environmental Factor**

o Adverse weather	o Debris	o Ice	o Navigation hazard
o Adverse current	o Submerged object	o Lightning	o Other . . .

### **Technical Factor**

o Structural failure	o Wear & tear	o Steering failure
o Mechanical failure	o Improper welding	o Inadequate firefighting/lifesaving
o Electrical failure	o Inadequate maintenance	o Insufficient fuel
o Corrosion	o Inadequate stability	o Other . . .

- 
- 4.1** The failure of **Toolka T** to recognise **Wainui** as a towing vessel with a barge in tow and the subsequent alteration of course by **Toolka T** across the stern of **Wainui** and into its towline and tow.

## OPINIONS & RECOMMENDATIONS

### OPINIONS

- 5.1 This accident was contributed to by breaches of the Collision Rules and by bad watchkeeping practice on both vessels.
- 5.2 The evidence of the helmsperson on **Toolka T** is that **Wainui** was first sighted five to six miles distant, on a reciprocal or nearly reciprocal course, so as to involve risk of collision. At this point, or shortly thereafter, two course alterations to starboard were made in an attempt to pass **Wainui** port to port. The evidence of the first watchkeeper aboard **Wainui** is that he first observed **Toolka T** at a distance of one mile, or possibly less. In a second interview, he stated he might have seen **Toolka T** at a greater distance, but could not say by how much. He was adamant that he saw only a green starboard sidelight and then a white masthead light. This is consistent with the evidence of **Toolka T** if, at that point, the yacht had completed its course alteration to port to pass starboard to starboard with **Wainui**.

The second watchkeeper, however, thought he initially saw both the port and starboard sidelights of **Toolka T** together and that it was heading towards **Wainui**. The only explanation for this observation, when considered alongside the evidence of the first watchkeeper, is that **Toolka T** was making a course alteration to starboard at that time. However, this is inconsistent with the evidence of **Toolka T**, which indicated that the two course alterations to starboard were made well before the yacht came within one mile of **Wainui**.

- 5.3 It was not possible to establish precisely at what time both vessels altered course. However, it is probable that if **Toolka T** made her two course changes to starboard, totalling 25° and then the larger course alteration to port of 45°, before her sidelights became visible, it would explain why the first watchkeeper on **Wainui** saw the starboard sidelight on **Toolka T**.
- 5.4 On the basis that the evidence of **Toolka T** is correct concerning the reciprocal or nearly reciprocal courses of both vessels, then the two course alterations to starboard that were made by **Toolka T**, whilst still some distance from **Wainui**, and at a time when **Wainui** was maintaining her course and speed should have resulted in the bearing of **Wainui** opening, thereby enabling the two vessels to pass each other port to port. The fact that this did not occur, suggests it is more likely that the two vessels were crossing at an acute angle, with **Toolka T** bearing on the starboard bow of **Wainui** at all times.

## RECOMMENDATIONS

- 6.1** The Master and Owners of **Wainui** failed to monitor on an on-going basis, the effectiveness of the crew in order to ensure compliance with Part 31B 8 (paragraph **2.2.29**). Accordingly, it is recommended that within two months of the publication of this report, the owning company incorporate written procedures into the SSM manuals for all their vessels, as follows:
- a) All watchkeepers employed by the company to be tested thoroughly on their knowledge of the Collision Rules to the satisfaction of the Master, before they are allowed to keep a navigational watch.
  - b) All watchkeepers are to receive adequate training sufficient to ensure that they are able to operate properly, to the satisfaction of the Master, the VHF and the following controls before they are allowed to keep a watch:
    - ∪ engine throttle and gear controls
    - ∪ ship's horn
    - ∪ spotlight
    - ∪ deck floodlights
  - c) All watchkeepers are to know how to take compass bearings and operate the radar to determine if there is a risk of collision before they are allowed to keep a watch.
  - d) The owners/operators of **Wainui** to conduct regular audits of the above and other safety requirements contained in the SSM manual to ensure compliance.

*After receipt of the draft report, the owners of **Wainui** amended their standing orders for navigational watchkeeping to include the following wording, "If any vessel approaches within 1 nautical mile of the tug and barge, the watchkeeper must be ready to follow the above instructions (call-up on VHF radio, channels 16, 6 or 8, to illuminate the tow with floodlights, shine spotlight on the other vessel, call Master etc.) as it cannot be assumed that the other vessel will be competently manned."*

*A crew training section in the SSM manual, where the master verifies mandatory training of the crew, will be modified to comply with **6.1 a), b) and c)** above. Also, Owners will arrange for their SSM company to conduct regular audits to comply with **6.1 d)** above. Finally, a "Watchkeepers Course" for all Masters, Mates and other 'ticketed' watchkeepers, employed by the owners of **Wainui**, will be run by Captain T Ridge. The course will cover the interpretation and practical application of the Collision Prevention Rules and participants will be made aware of their accountability in following company standing orders and operating procedures. Captain Ridge, who holds an Extra Master's Certificate, spent about 20 years teaching at the NZ Maritime School (when it was part of the Ministry of Transport). In addition, he spent a period of approximately three years as an examiner of Masters and Mates in Auckland.*

- 6.2** It is recommended that the Company be censured for its failure to conduct compliance monitoring to ensure the crew were able to operate the vessel effectively in accordance with the requirements of Maritime Rule Part 31B.
- 6.3** It is recommended that the Master be censured for his failure to ensure the watchkeepers were properly trained and the safety standards in the SSM manual were met.
- 6.4** It is recommended that Crew #2 be severely censured for failing to navigate **Wainui** in accordance with the requirements of Maritime Rule Part 22 – Collision Rules.
- 6.5** It is recommended that Crew #3 be severely censured for his failure to navigate **Wainui** in accordance with the requirements of Part 22 – Collision Rules and for failing to operate the whistle and searchlight and warn **Toolka T** that it was running into danger.
- 6.6** The helmsperson on **Toolka T** contravened the aforesaid Collision Rules. Accordingly, the following recommendations are made:
- a) She be severely censured.
  - b) She obtains a Boatmaster qualification before undertaking a navigational watch. *Crew #1's legal advisers have informed the MSA that their client has enrolled for a Boatmaster's course, which is due to commence on 17 August 2002.*
- 6.7** This accident is yet another example that highlights a serious lack of knowledge of the Collision Rules on some recreational and commercial vessels which, in this case, regrettably resulted in loss of life. The Investigator is aware of several accidents and incidents involving recreational and commercial vessels which, when travelling at night, have either come close to, have been caught in, or have passed over tow lines. The Investigator believes such accidents and incidents are caused by an unacceptably high percentage of small craft operators failing to properly identify tugboats and their tows. This is due mainly to a lack of knowledge of the navigation lights such vessels are required to display. Accordingly, it is recommended that:
- a) A summary of this accident be included in the annual Maritime Safety Authority (MSA) Commercial and Recreational Accident Books for 2002-2003.
  - b) That the MSA issue a Boat Notice drawing the attention of mariners to the failure of many operators to identify correctly the navigational lights and day shapes exhibited by a tug and tow.

- c) That the Education and Communications Division of the MSA issue a press release drawing the attention of the public to the facts of this case and of the importance of identifying properly the navigational lights and day shapes of a tug and tow. The press release to be sent to the publications, Professional Skipper, all boating magazines, the Coastguard Federation magazine and National Pleasure Boat Safety Advisory Group (NPBS) forum members.

**6.8** It is recommended that a copy of the report be given to the Safety Standards Division of the MSA. This to include a recommendation that they critically review the need to ensure that all bridge watchkeepers on commercial vessels are appropriately qualified.

**6.9** Finally, it is recommended that a copy of the report be placed on the MSA web site.