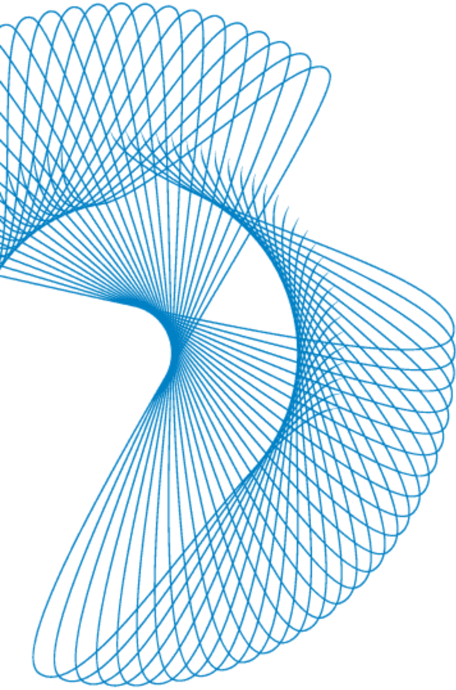
MARITIME NEW ZEALAND



Accident Report

Serious Harm Injury

Riptide

1 December 2005

Class A

Riptide

REPORT NO.: 96 489

VESSEL NAME: *RIPTIDE*

Ship Type:	Mussel Harvesting vessel
Certified Operating Limit:	Inshore
Flag:	New Zealand
MSA No.	122478
Built:	1991
Construction Material:	Aluminium
Length Overall (m):	24.33
Gross Tonnage:	45
Registered Owner:	Paddy Bull Ltd
Ship Operator/Manager:	Peter Bull
SSM Company:	Maritime Management Services
Accident Investigator:	Andrew Hayton

SUMMARY

On 1 December 2005, a crewmember onboard the mussel harvester ***Riptide*** suffered serious leg injuries when his right leg was dragged into an item of deck machinery after his leggings became caught on a turning tine.

At the time of the accident, the crewmember had climbed on top of the mussel tumbler casing to cut free a growing line. He had not stopped the tumbler prior to climbing on top of it.

THE ACCIDENT

At approximately 0600 hours NZDT (New Zealand Daylight Time) on 1 December 2005, the mussel harvesting vessel ***Riptide*** sailed from Sugerloaf boat ramp in Coromandel Harbour bound for mussel beds approximately five miles distant *(See Figure 1)*. The vessel was manned by a Skipper and a crew of four.

Riptide proceeded through Little Passage between Whanganui Island and the Ruffin Peninsula. She arrived at the mussel beds to the west of Motukopaka Island at approximately 0645 hours and moored alongside the mussel lines *(See Figure 1)*.

Shortly after arriving at the beds, the crew commenced harvesting operations on the foredeck of the vessel *(See Photograph 1)*. The injured bargehand (Crewmember 1) was engaged in cutting the growing lines on the port side of the vessel, with the Skipper grading mussels on the starboard side table. One bargehand was changing bags and the other two bargehands were sewing and stacking the bags of mussels at the after end of the foredeck.

At approximately 0745 hours, Crewmember 1 was at the after end of the foredeck on the port side. He was removing a floatation buoy off the backbone rope. He noticed that the growing line which was presently being worked had come on deck quicker than he had expected and had been lifted off the side of the chute *(See Photograph 1)*. There was a danger of the sacrificial lashing parting when the weight came on it and with the end of the growing line over the forward side of the chute, the remaining mussels were being stripped off the line onto the deck rather than in the tumbler *(See Photographs 2 & 3)*. He rushed towards the tumbler and stopped the sheave winch by turning the knob at the aft end of the tumbler *(See Photograph 4)*. He then quickly decided to climb up the chute and onto the top of the tumbler in order to cut the sacrificial lashing that connects the bight of growing line to the backbone so he could place the end of the growing line back onto the chute.

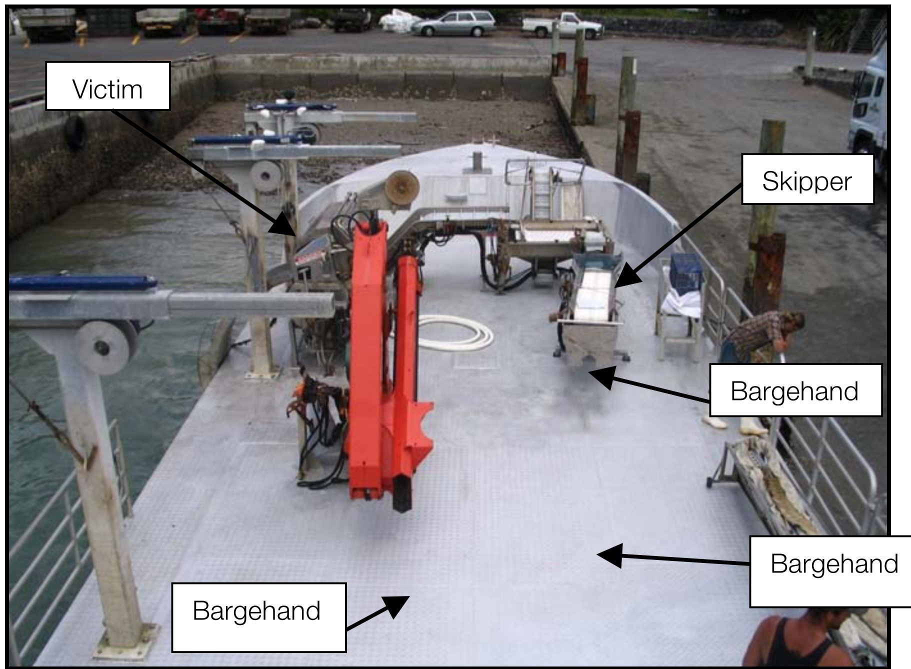
Whilst he was standing on top of the tumbler casing, a turning tine within the tumbler managed to catch on Crewmembers 1's leggings, or his steel capped gum boots, and his right leg was dragged into the tumbler. As soon as Crewmember 1 realised what was happening, he shouted for help and managed to reach to the hydraulics controls and turn off the tumbler hydraulics which stopped the tumbler turning within approximately half a turn.

The other crewmembers rushed to his aid but it was decided that it was not possible to extract the injured man from the tumbler as his boot was trapped between the end of a tine and the tumbler wall. Crewmember 1 was wrapped in a blanket and given some Paracetamol tablets.

The Skipper manoeuvred the vessel away from the mussel beds and headed for port at full speed. En-route he called the emergency services on his cell phone. The Skipper's initial intention was to proceed back to Sugarloaf, but he later decided that it would be quicker to head to Coromandel wharf.

Riptide berthed at the Coromandel Wharf and the emergency services arrived shortly afterwards. A local engineering company used cutting equipment to remove the tines trapping Crewmember 1's leg and he was then able to be extracted from the tumbler.

The injured man was airlifted to hospital in Auckland by helicopter.



Photograph 1
Approximate location of crewmembers at the time of the accident

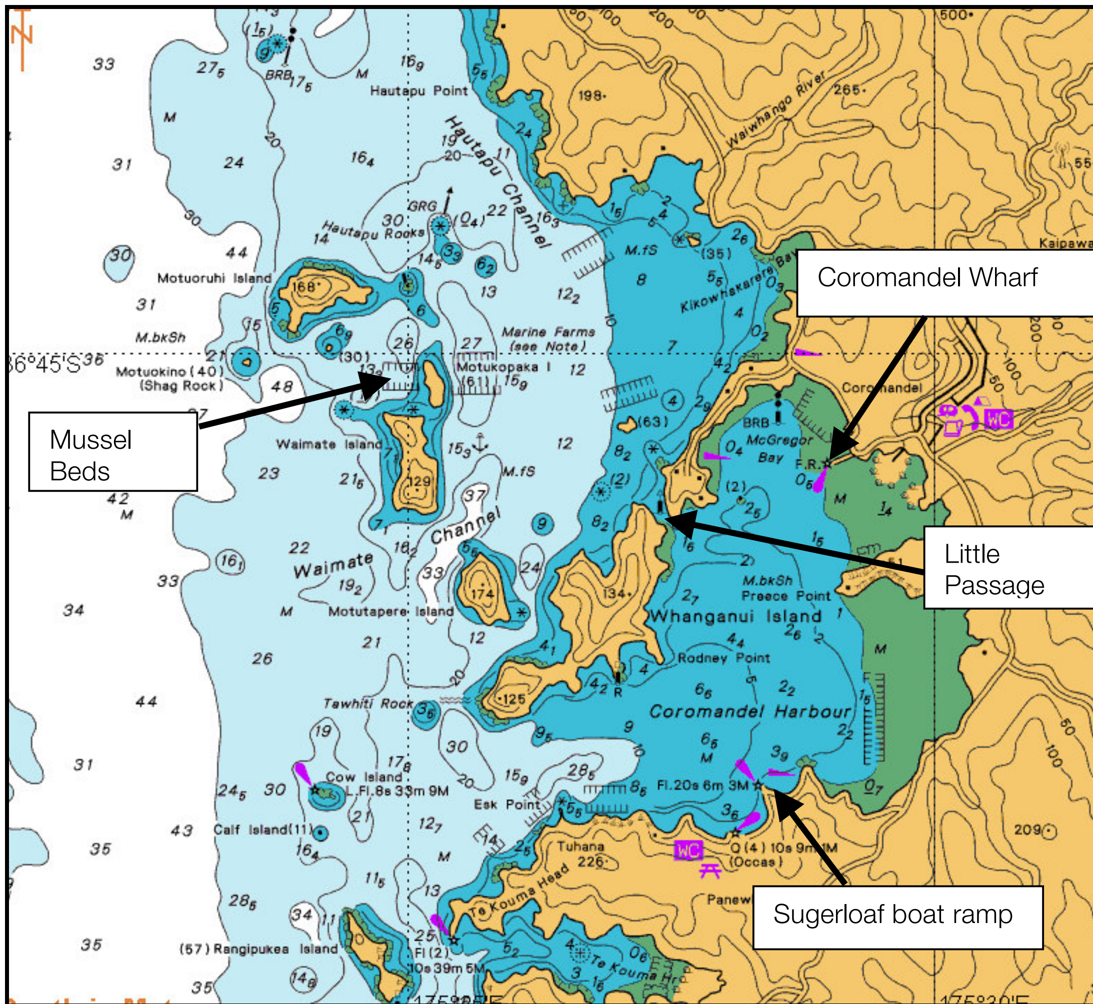
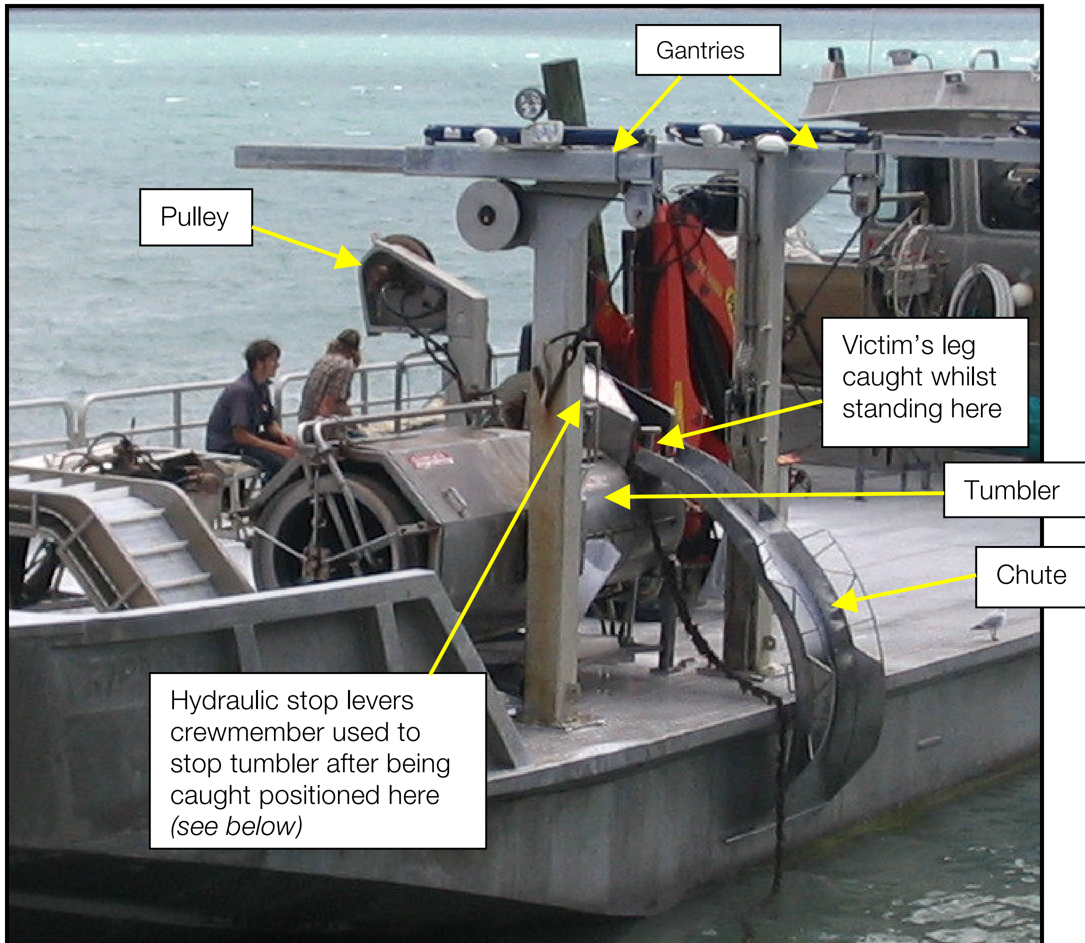
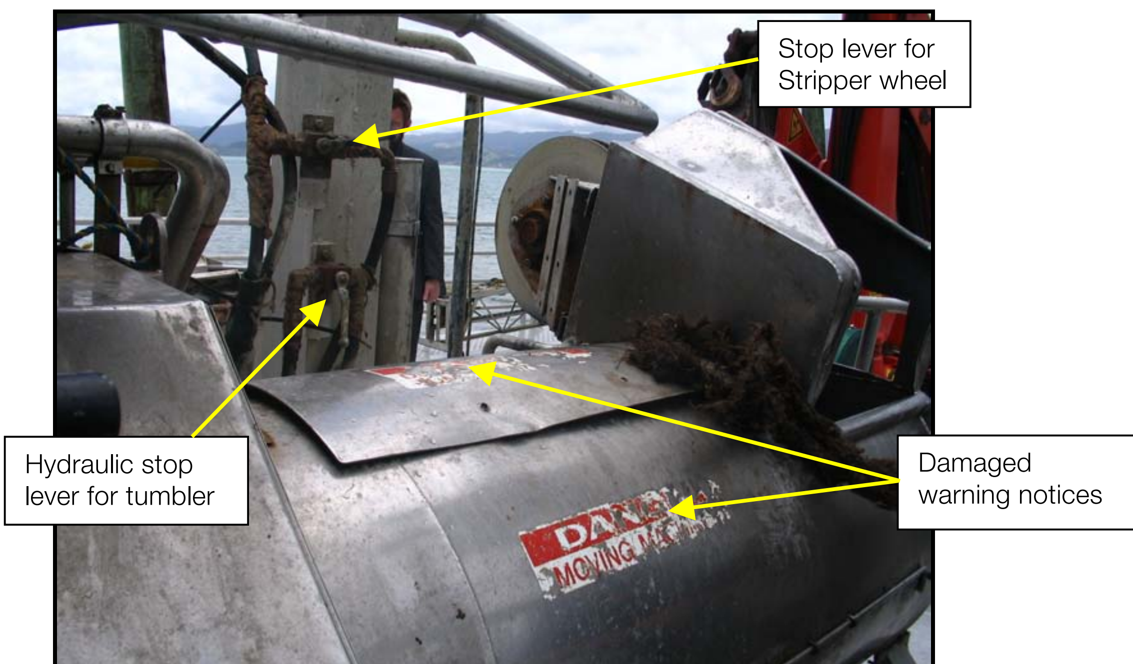


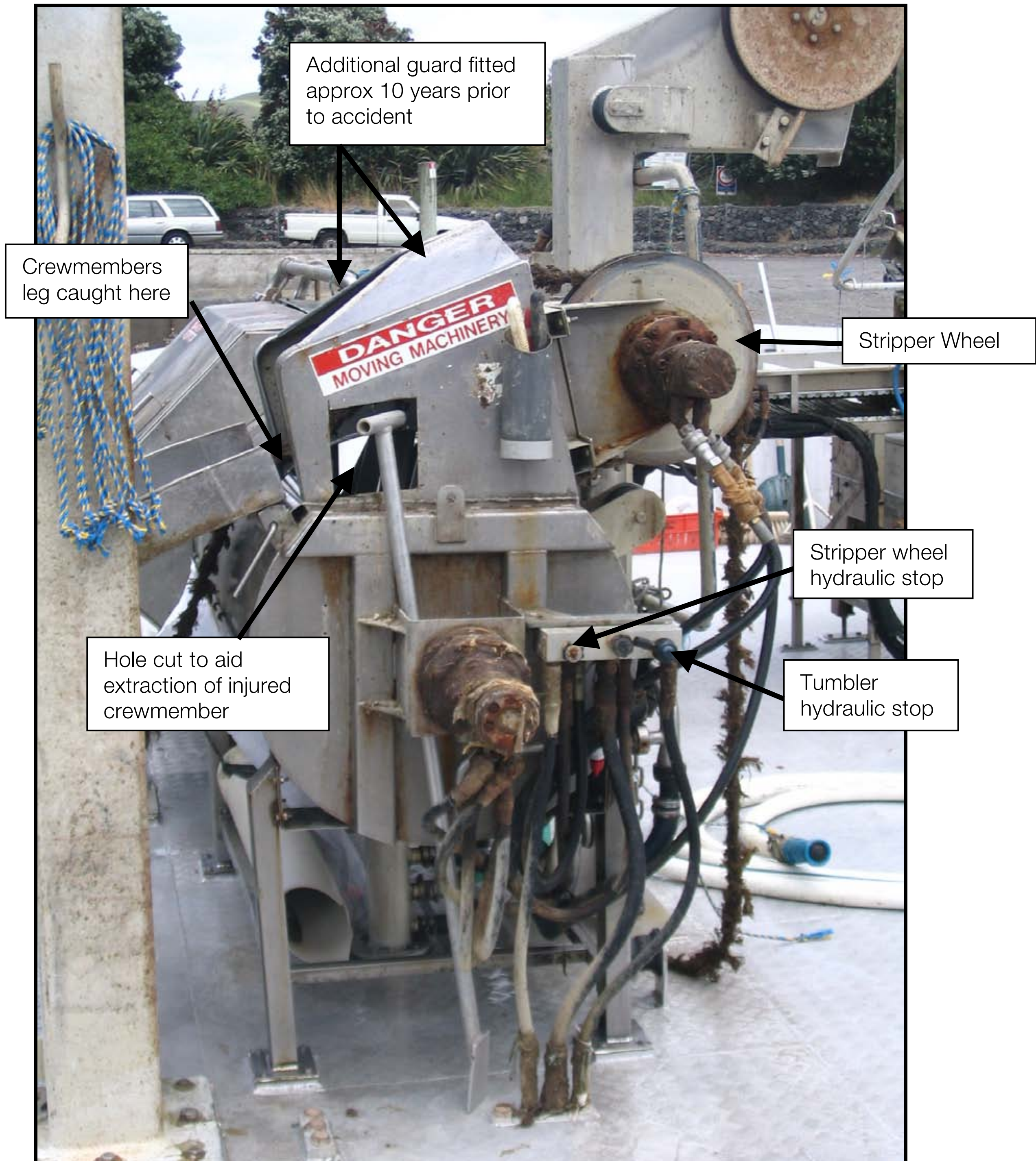
Figure 1
Chartlet of Coromandel Harbour



Photograph 2
Overview of Tumbler



Photograph 3
Close up of Tumbler



Photograph 4
View of Tumbler from aft

COMMENT & ANALYSIS

Vessel

When the vessel has moored alongside the mussel lines, the normal procedure is for a crew member to use a grapple hook to retrieve the backbone rope which is under the surface of the water and supported by floatation buoys. The backbone rope is then attached to one of two gantry cranes, one on each side of the vessel, which hoist the backbone rope clear of the water.

Suspended vertically from the backbone line are growing lines. These growing lines are attached to the backbone by means of a sacrificial lashing that reach to a depth of approximately 8.5 metres below the surface. The growing line then doubles back and is again attached at its other end to the same backbone by means of another sacrificial lashing. The end of the growing line is then passed through a constriction over the tumbler before being passed around the peeler wheel and another sheave. When the growing line passes through the constriction, the mussels which are attached to the line are stripped off and fall into the tumbler where they are de-clumped by chains and rotating tines. The stripped line is coiled down in a bag on deck.. The loose mussels pass through the tumbler and then they are washed and any debris removed. They then pass down a conveyor belt before being sorted and graded and ultimately bagged at the end of the grading table. The full bags are sewn and stacked on the foredeck for shipment back to port where they are discharged using one of the vessel's cranes.

There are several means of stopping the tumbler from operating. There are three hydraulic system stops on the foredeck in the vicinity of the tumbler. In the wheelhouse, there is a stop knob on the port side of the consol. By turning off the ignition key on the wheelhouse consol, all deck machinery stops. All crewmembers including the injured man, knew where these stops were located and what function they performed. None of these stops is marked as to its function. The injured crewmember stopped the stripper wheel by turning the tap at the aft end of the tumbler. The adjacent tap stops the tumbler hydraulics but he did not stop the tumbler operation before he climbed onto the casing of the tumbler as he did not want to halt the work of the other crew whilst he freed the growing line.

There were three warning signs stating "Danger Moving Machinery" displayed on the casing of the tumbler, however two of these were badly worn, only one being prominent.

Riptide holds a valid Safe Ship Management Certificate issued on 31 January 2002 and valid to 31 January 2006. The last Safe Ship Management inspection is recorded as having taken place on 11 January 2004. There were no recorded deficiencies for this inspection.

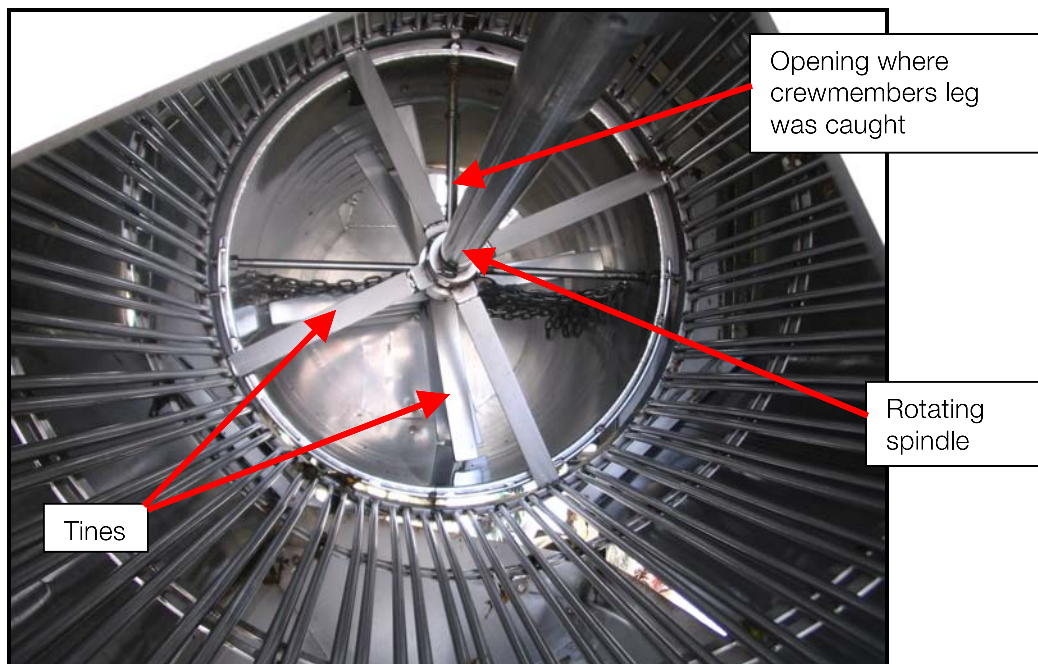
The vessel was last subject to a Maritime New Zealand Flag State Inspection on 12 November 2003. There was one deficiency recorded during this inspection. The vessel's sound signal was found not to be operating correctly.

The tumbler was manufactured by Ansco in Nelson and was fitted to the vessel during building.

Approximately ten years ago, the guard at the entrance of the tumbler was modified to provide more protection for crew.

Within the tumbler, stainless steel tines turn anti clockwise at a speed of 22 rpm. There are nine sets of tines welded to a central spindle which is mounted horizontally. Each set consists of two tines that are welded 180mm apart on the spindle. The tumbler is hydraulically powered.

The Owner and Master stated they had never previously seen anybody climb on top of the tumbler. One of the Deckhands stated he had seen crewmembers climb on top of the tumbler before without the knowledge of the Owner or Master and that they would have been disciplined if caught. The injured crewmember claims to have climbed onto the tumbler several times prior to the accident to the knowledge of the Skipper and had not been warned.



Photograph 5
Inside of Tumbler looking from forward end

Crew

Riptide was operating within the Coromandel Enclosed Waters limit and as such was correctly manned at the time of the accident.

The Skipper held a valid New Zealand Commercial Launch Masters Certificate of Competency issued in 1996. He has 20 years experience working on Mussels Harvesters, having been employed by the owner of ***Riptide*** for that entire period. The Skipper held a First Aid Certificate obtained after completing a one day first aid course in February 2005.

One of the Deckhands held a valid New Zealand Inshore Launch Masters Certificate of Competency issued in 2005, having held a Local Launch Masters Certificate of Competency since 1998. He has worked onboard mussel harvesting vessels for approximately 11 years and is the regular Skipper onboard another of the owners vessels.

The injured crewmember had been employed as a barge hand by the owner of ***Riptide*** for approximately two and a half years prior to the accident. He possessed no formal maritime qualifications.

One of the other barge hands had been employed onboard ***Riptide*** for approximately three years prior to the accident. He possesses no formal maritime qualifications but has 18 years experience working on mussel harvesting vessels.

The other barge hand had worked onboard ***Riptide*** for approximately seven months prior to the accident. He possesses no formal maritime qualifications.

The crew work a pattern of six days on followed by one day off. Four of the working days are spent harvesting, during which the crew work approximately seven hours. The remaining two days are spent seeding during which the crew work approximately ten hours.

The injured crewmember claims that he had a good nights rest prior to the accident and that he was not fatigued. The injured crewmember also claims not to have consumed alcohol for at least two years prior to the accident or to have taken drugs in the period leading up to the accident.

Owner

The Director of the company which owns ***Riptide*** holds a New Zealand Commercial Launch Masters Certificate of Competency issued in 1998. Prior to this he held a Certificate of Competency as Master of Restricted Limit Launch which he obtained in 1981. He has been involved in the mussel harvesting industry for 23 years.

The company owns two mussel harvesting vessels and employs six people. The company has owned ***Riptide*** since new.

Health & Safety

At the time of the accident, the vessel had a Hazard Identification Register. It was contained within the vessels Safe Ship Management manual and kept in the wheelhouse. One of the hazards which had been identified and registered was that of 'Moving Machinery". This hazard had been deemed to be significant and not possible to eliminate or isolate. The register records controls required to minimise the hazard as being 'warning stickers, guards, crew made aware of'.

Since the accident, the register has been updated to include individual items of machinery.

The vessels Safe Ship Management manual contained the requirement for crew training records to be maintained onboard. At the time of the accident there is no evidence of crew training having been recorded.

Also located within the Safe Ship Management manual are sign off checklists for the Induction Of New Crew. There are none onboard dated prior to the accident, but since the accident, six crewmembers have signed sheets. Amongst the items for new crewmembers to be instructed into the use of are 'loose clothing near rotating machinery' and 'reaching into tumbler'.

The Skipper claims to conduct regular safety training and induction training of new crew but admits that in the past, the recording of such training has been neglected. Two crewmembers and the owner also claim that training is ongoing onboard ***Riptide***. When interviewed, the injured crewmember claims that he was not given any induction training and learnt the job himself through observing other crewmembers. However later in his interview, he acknowledges that another crewmember showed him how various pieces of equipment operated.

The Skippers claims that when a new crewmember commences employment onboard ***Riptide***, they initially start work exchanging full bags of mussels at the end of the grading table for empty ones. Once they start to learn the ropes, they are gradually introduced to other jobs onboard.

The vessel had an accident register located in the wheelhouse. The accident register had been completed in the past but this accident had not been entered at the time of inspection 13 days after the accident occurred.

The Skipper and two of the other Deckhands claim that it was most unusual for a crewmember to climb onto the top of the tumbler to carry out the operation which the injured crewmember was attempting. The Skipper said that he would have disciplined the crewmember if he had seen him climb up. *In commenting on the report, the Owner stated that neither he nor the Skipper had ever seen such a thing and did not anticipate anyone doing it.* The injured crewmember claims to have climbed up on top of the tumbler numerous times in the past without being disciplined.

There were no records of the victim having had any induction training prior to commencing work onboard ***Riptide.***

There are no training records for the crew of ***Riptide.***

On the vessels Hazard Identification register, moving machinery had been identified as a hazard.

Several of the crewmembers interviewed after the accident did not know what the term Hazard Identification meant and did not know of the existence of the hazard register.

At the time of the accident, the victim was wearing waterproof leggings and steel toe capped rubber boots in addition to his personal clothing. The leggings and boots were provided by the vessels owner.

In the vessels Safe Ship Management manual, there is a schedule for crew training and drills. The month of October lists the training scheduled for that month to be “working near operating machinery and open sides” There are no records of that training having been carried out.

The Health and Safety in Employment Act 1992 Section 19 Duties of Employees states:

> *Every employee shall take all practicable steps to ensure-*
>
> *(a) the employees safety at work (including by using suitable protective clothing and suitable protective equipment provided by the employer or, if section 10(4) applies, suitable protective clothing provided by the employee himself or herself); and*
>
> *(b) that no action or inaction of the employee while at work causes harm to any other person.*

Injury

The injured crewmember suffered a fractured tibia bone and numerous lacerations to his right leg.

CONCLUSIONS

- A crewmember onboard ***Riptide*** was climbing over moving machinery when his leggings became caught on a rotating tine. His right leg was dragged into the tumbler. The crewmember managed to promptly stop the machinery but a bone in his lower leg was fractured.

- The crewmember should have turned off the hydraulics to the tumbler, thereby stopping the machine, prior to climbing on top of it.

SAFETY RECOMMENDATIONS

1. It is recommended that the owner of ***Riptide*** ensures that all training of crewmembers is recorded and records of such training are retained. *In commenting on the draft report, the Owner confirmed that this recommendation has been implemented and training is being regularly recorded on an ongoing basis.*

2. It is recommended that the owner of ***Riptide*** ensures that all controls to stop deck machinery are conspicuously marked. *In commenting on the draft report, the Owner confirmed that this recommendation has been implemented. The controls to stop the deck machinery have all been covered in red heat shrink material and an additional guard has been extended 400mm down the chute.*

3. It is recommended that the owner of ***Riptide*** critically reviews the guarding arrangements at the entrance to the tumbler. *In commenting on the draft report, the Owner confirmed that this recommendation has been implemented.*

4. It is recommended that this report be promulgated to the mussel harvesting industry.