Australian Government

Australian Transport Safety Bureau

ATSB TRANSPORT SAFETY INVESTIGATION REPORT

Marine Occurrence Investigation No. 224

Final

Independent investigation into the collision between the Panamanian registered bulk carrier

# Global Peace

and the Australian registered tug

# Tom Tough

in the Port of Gladstone, Queensland

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Independent investigation into the collision between the Panamanian registered bulk carrier *Global Peace* and the Australian registered tug *Tom Tough* in the port of Gladstone, Queensland on 24 January 2006


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Cover photograph courtesy of Maritime Safety Queensland.

Photograph of clutch oil pipe during repairs courtesy of Adsteam Harbour.



**Abstract**

On the evening of 24 January 2006 *Global Peace* entered Gladstone harbour for the transit to the Clinton Coal Terminal. The plan was for the ship to berth at Clinton number three berth with the assistance of three harbour tugs.

As the ship was approaching the berth, the pilot ordered all three tugs to stop pushing and to lay alongside. The master of the aft tug, *Tom Tough*, laid the tug alongside the ship, with the tug at an angle of about 15 degrees to the ship's side. The tug's bow was in line with the front of the ship's accommodation.

At about 2354, *Tom Tough*'s starboard main engine unexpectedly shutdown, and the tug's stern swung sharply to starboard. The tug's starboard quarter made heavy contact with the ship, puncturing the ship's shell plating in way of the port heavy fuel oil tank. Oil immediately began to flow into the harbour.

The investigation found that a crack in the tug's starboard main engine clutch oil discharge pipe resulted in the system being emptied of oil. The resultant loss of system pressure activated the engine shutdown.

The report identifies a number of contributing factors and makes recommendations to address them.

# THE AUSTRALIAN TRANSPORT SAFETY BUREAU

The Australian Transport Safety Bureau (ATSB) is an operationally independent multi-modal Bureau within the Australian Government Department of Transport and Regional Services. ATSB investigations are independent of regulatory, operator or other external bodies.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to fare-paying passenger operations. Accordingly, the ATSB also conducts investigations and studies of the transport system to identify underlying factors and trends that have the potential to adversely affect safety.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and, where applicable, relevant international agreements. The object of a safety investigation is to determine the circumstances to prevent other similar events. The results of these determinations form the basis for safety action, including recommendations where necessary. As with equivalent overseas organisations, the ATSB has no power to implement its recommendations.

It is not the object of an investigation to determine blame or liability. However, it should be recognised that an investigation report must include factual material of sufficient weight to support the analysis and findings. That material will at times contain information reflecting on the performance of individuals and organisations, and how their actions may have contributed to the outcomes of the matter under investigation. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

Central to the ATSB's investigation of transport safety matters is the early identification of safety issues in the transport environment. While the Bureau issues recommendations to regulatory authorities, industry, or other agencies in order to address safety issues, its preference is for organisations to make safety enhancements during the course of an investigation. The Bureau is pleased to report positive safety action in its final reports rather than make formal recommendations. Recommendations may be issued in conjunction with ATSB reports or independently. A safety issue may lead to a number of similar recommendations, each issued to a different agency.

The ATSB does not have the resources to carry out a full cost-benefit analysis of each safety recommendation. The cost of a recommendation must be balanced against its benefits to safety, and transport safety involves the whole community. Such analysis is a matter for the body to which the recommendation is addressed (for example, the relevant regulatory authority in aviation, marine or rail in consultation with the industry).

# 1 EXECUTIVE SUMMARY

At 2130 on 24 January 2006, two Gladstone harbour pilots boarded *Global Peace* for the transit from the anchorage to the Clinton Coal Terminal. The plan was for the ship to turn in the Clinton Swing Basin and berth starboard side to at Clinton number three berth, to load coal for export to Korea.

At about 2320 three tugs were made fast to the ship. The aft tug, *Tom Tough* was made fast to *Global Peace* using its forward tow line. The tow line was made fast through the ship's panama lead adjacent to the forward end of the number nine hatch on the port side of the ship. At this time the ship was passing the Gladstone Harbour Auckland Channel number three beacon.

The transit from the anchorage to the Clinton Swing Basin went to plan in all respects, and was routine up until the completion of the ship's swing.

At the completion of the ship's swing, *Tom Tough*'s master laid the tug alongside the ship, with the tug at an angle of about 15 degrees to the ship's side. The tug's bow was in line with the front of the ship's accommodation.

As the ship started to move ahead *Tom Tough*'s master maintained the tug's position alongside. He held the main engine revolutions at idle and set the uni-lever (the joystick that controls the tug's two z-peller drives) just ahead of the neutral position. This enabled the tug to keep up with the progress of the ship while keeping weight off the tow line.

At about 2354 *Tom Tough*'s stern swung sharply to starboard. The tug master checked the main engine tachometers and they were both indicating idle revs. He scanned the console dials a second time and noticed the revolutions were falling away on the starboard main engine. He surmised that the starboard main engine was in the process of shutting down and that the loss of thrust from the starboard z-peller was causing the tug's stern to swing to starboard.

The tug master de-clutched the port main engine. While he had reacted quickly, he was too late. The tug's starboard quarter had already made heavy contact with the side of the ship, puncturing the ship's shell plating in way of the port deep fuel oil tank.

The tug master informed the pilot that one of *Tom Tough*'s engines had failed and that the tug had collided with the ship, penetrating the ship's hull. He also informed the pilot that oil was flowing from the hole in the side of the ship into the harbour.

The report concludes that:

- The failure of the starboard main engine clutch oil discharge pipe resulted in the system being emptied of oil. The resultant loss of system pressure activated the engine shutdown.
- When the starboard main engine shut down, the tug's stern swung sharply to starboard and the tug's starboard quarter made heavy contact with the ship.

- The tug's aft fender arrangement did not provide adequate protection to the tug or the ship.
- The towage company had given little thought to the possibility of further fatigue related failures after the failure of the clutch oil pump discharge pipe fitted to the port main engine in February 2002.
- The towage company's procedures and associated risk analysis had not adequately addressed the risks associated with the engineer spending protracted periods of time out of the engine room, and thus being unable to actively monitor the running machinery.
- The activation of a critical alarm did not alert the tug master to the starboard main engine shutdown. Had the alarms alerted him it may have given him more time in which to take action.
- *Global Peace*'s port deep fuel oil tank was unprotected, and thus when the shell plating was punctured the tank's contents were free to flow into the harbour.

It is also considered that:

- The towage company had no system of professional development in place to ensure the ongoing training and performance monitoring of tug masters.

The report recommends that:

- Adsteam Harbour should review their current maintenance and reporting systems with a view to implementing procedures that consider the causes of failures and the likelihood and risks associated with similar failures in the future.
- Adsteam Harbour should carry out an assessment of the risks associated with the engineer being in the engine room during various stages of towage operations, with a view to developing procedures and practices to ensure the running machinery is more actively monitored.
- Adsteam Harbour should review the alarm and monitoring systems fitted on board *Tom Tough*, and similar tugs in their fleet, with a view to ensuring that the alerting of tug masters to critical alarms is adequate.
- All owners and operators of tugs should consider carrying out a risk analysis of their towage operations with a view to implementing a system of ongoing professional development and training in emergency procedures for their tug masters.

# 2 SOURCES OF INFORMATION

The master and crew of *Global Peace*

The master and crew of *Tom Tough*

Maritime Safety Queensland

Adsteam Harbour

## References


The Adelaide Steamship Company Limited 'Tug master's training manual on effective use of omni-directional stern drive tugs'

Australia Pilot Volume III (NP15), HM Hydrographic Office, Ninth Edition 2002

The International Convention for the Safety of Life at Sea, 1974, and its Protocol of 1988 (SOLAS), the International Maritime Organization.

International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78), the International Maritime Organization.

# 3 NARRATIVE

## 3.1 *Global Peace*

*Global Peace* is a Panamanian registered 'cape-sized' [1] bulk carrier. The ship is owned by Giant Marine Shipping in Panama, operated by Korea Line, in Seoul, Korea and managed by Korea Marine in Busan, Korea. The ship is classed with the Korean Register of Shipping (KR).

*Global Peace* was built in 1982 by Mitsui Engineering and Shipbuilding in Tamano, Japan. The ship is a conventional bulk carrier with nine cargo holds located forward of the accommodation superstructure. It has an overall length of 263.00 m, a beam of 42.07 m and a depth of 22.81 m. The ship has a deadweight of 132 049 tonnes at its summer draught of 16.79 m.

**Figure 1: *Global Peace* berthed in Gladstone**


Propulsive power is provided by a six cylinder Mitsui B&W 6L80GFCA, single acting, direct reversing two-stroke diesel engine developing 13 500 kW. The main engine drives a single fixed pitch propeller which gives the ship a service speed of 13 knots.

*Global Peace* has two double bottom heavy fuel oil tanks located forward, between frames 97 and 149; port and starboard heavy fuel oil deep tanks located aft, between frames 42 and 46 (Figure 2), and settling and service tanks that are located between frames 38 and 42.

1 Dimensions larger than that allowable for transit of the Panama Canal.

**Figure 2:** ***Global Peace* with the location of the port deep fuel oil tank indicated**


The port and starboard deep fuel oil tanks each have a capacity of 451 cubic metres, and on 24 January 2006 the port deep fuel oil tank contained about 150 cubic metres of heavy fuel oil.

At the time of the incident, *Global Peace*'s crew of 21 consisted of one Chinese, eight Myanmar and 12 Korean nationals.

While at sea, the mates and engineers maintain a watchkeeping routine of four hours on, eight hours off. Whilst at anchor or in port, the mates continue their watchkeeping routine while the engineers work during the day with one engineer on call at night.

The master held a master class one certificate of competency, issued in Korea. He had 18 years seagoing experience. He had been the master of *Global Peace* for three months prior to the incident and had previously completed a 17 month contract on the ship.

The second mate, the mate assigned to the aft mooring station on 24 January, held a chief mate's certificate of competency, issued in Korea. He had 10 years seagoing experience and had been on board *Global Peace* for almost 12 months.

### 3.1.1 The pilot

The Gladstone harbour pilot held a master class one certificate of competency that was issued in Australia in 1996. He had a seagoing career that spanned 22 years, which included over 20 years experience in a variety of large trading ships as well as 18 months in the offshore oil industry.

He had joined Maritime Safety Queensland (MSQ) as a trainee Gladstone pilot three years prior to the incident and underwent a training program that included manned-model simulator training, an advanced marine pilot training course, mentoring and on the job training. He was licensed as a level three Gladstone pilot; this enabled him to pilot ships up to 263 metres in length.

At the time of the incident the pilot was undergoing a re-classification of his licence. As part of this process his performance on board *Global Peace* was being monitored by a fully licensed and unrestricted check pilot.

## 3.2 *Tom Tough*

*Tom Tough* is an Australian registered motor tug (Figure 3). The vessel is owned and managed by Adsteam Harbour and is classed ✠A1 towage service[2](E)[3] ✠AMS[4] ✠ACCU[5], with the American Bureau of Shipping (ABS).

**Figure 3: *Tom Tough* in Gladstone harbour**

*Tom Tough* was built in 1983 by Carrington Slipways in Newcastle, Australia. The vessel has an overall length of 33.91 m, a beam of 11.10 m and a depth of 5.41 m. It has a deadweight of 368 tonnes at a draught of 4.94 m.

*Tom Tough* is powered by two, six cylinder Daihatsu 6DSM-28 diesel engines, each developing 1 325 kW at 720 rpm, and together they provide the tug with 46 tonnes of bollard pull. Each main engine is clutched into an azimuth stern drive unit (z-peller). The z-peller drive units, manufactured by Niigata, consist of an upper and lower gearbox and shaft assemblies connected by vertical drive shafts to form a 'z' shaped propeller drive train. Each final horizontal drive shaft is connected to a fixed pitch propeller inside a kort nozzle. The nozzle and propeller (stern drive units) can be rotated through a full 360 degrees.

2 Hull built to ABS rules.

3 Equipment such as anchors and cables in compliance with ABS rules.

4 Machinery built to ABS rules.

5 Automatic Centralised Control Unmanned.

**Figure 4:** ***Tom Tough*'s forward wheelhouse console uni-lever**

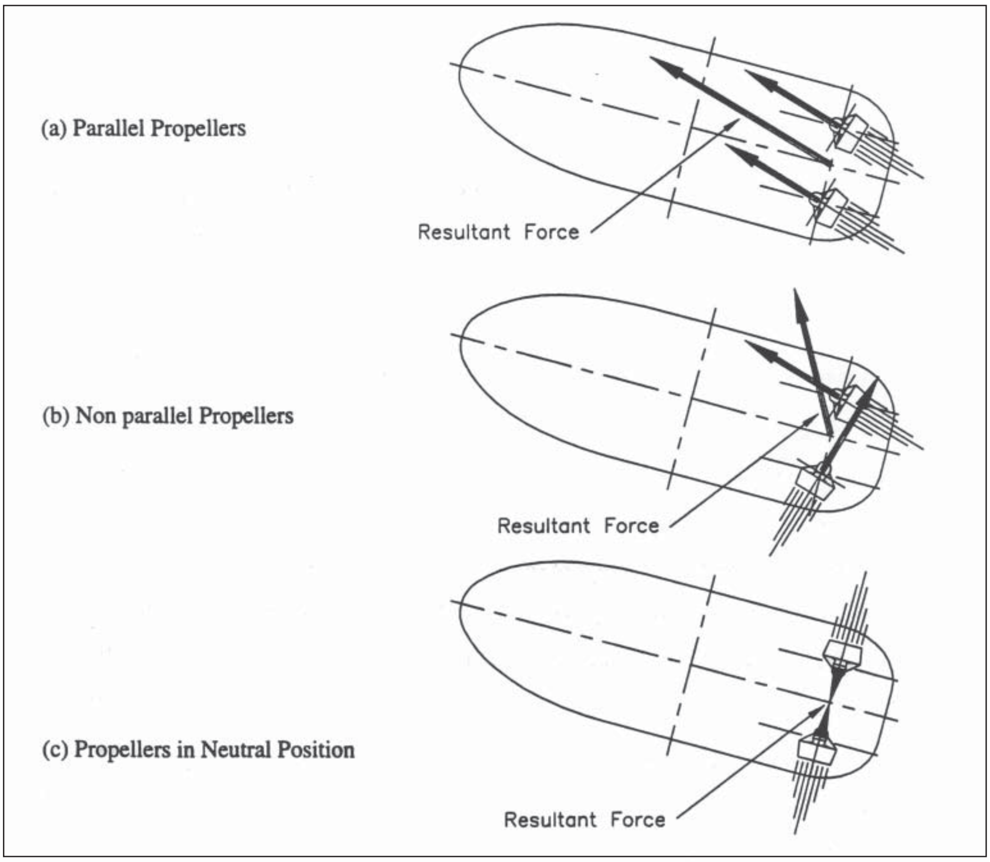
**Figure 5:** ***Tom Tough*'s wheelhouse console engine speed / clutch controls**

In normal circumstances, the rotation of the stern drive units, and the consequent vectoring of the propeller thrusts, is effected by a single joy stick (uni-lever) control. The uni-lever is mounted on the forward console of the tug wheelhouse (Figure 4) and can be used to provide directional control as well as speed through the water for a given engine speed setting. The general principle is that the tug will move in the direction in which the uni-lever is placed, with a combination of rotational and translational movement made possible by the control system vectoring the propeller thrusts in various ways.

Engine speed control, and thus propeller thrust, is also independent for each main engine. The wheelhouse console is fitted with a pair of combined clutch and engine speed controls adjacent to the uni-lever control (Figure 5). The tug's manoeuvrability may be further enhanced by the tug master varying the speed of each engine in combination with various uni-lever settings.

The z-peller system uses the resultant forces produced by the two propellers to control the tug's direction and speed through the water (Figure 6). The system provides for highly manoeuvrable tugs, but relies on the balance of propeller thrust being maintained to provide directional stability, particularly when the tug is being manoeuvred at low speeds.

**Figure 6: Schematic diagram showing examples of the forces produced by a pair of z-peller drives**



### 3.2.1 Automatic Centralised Control Unmanned (ACCU)

The ABS notation ACCU indicates that the vessel is fitted with equipment that enables the propulsion machinery to be monitored and controlled from the navigation bridge.

*Tom Tough*'s navigation bridge is fitted with an alarm panel which differentiates between three types of main engine alarms (Figure 7); non critical alarms, critical alarms and engine shutdowns. The panel is mounted below knee level, to port and behind the tug master's operating position, which is midships facing forward. The tug is also fitted with alarm panels in the accommodation and on the forward and aft decks.

**Figure 7: The engine room alarm panel as fitted on *Tom Tough*'s bridge**

### 3.2.2 *Tom Tough*'s crew

*Tom Tough*'s crew consisted of the master, one engineer and one integrated rating (IR). During towage operations the master remains on the bridge, while the engineer attends to engine room monitoring, engine room alarms and assists the IR with lines handling and deck operations as required.

The tug master held a master class three certificate of competency, issued in South Australia. He had spent six years in the Royal Australian Navy, and then a number of years in small craft and tugs before working on larger harbour tugs. He had been master on larger harbour tugs for the previous 15 years; with at least five of those years spent on tugs with z-peller drive systems. He had been a tug master in Gladstone for three years and was regularly the master of *Tom Tough*.

The engineer held a class one certificate of competency, issued in 1992 in Australia. He had 20 years seagoing experience in large trading vessels before joining the Gladstone tugs. In the previous five years he had worked on all of Adsteam's Gladstone tugs, all of which are fitted with z-peller drive systems. On 24 January he had been called in as a relief engineer for the night shift. *Tom Tough* was not his regular tug, however he had sailed on the vessel on a number of previous occasions.

## 3.3 Gladstone

The port of Gladstone is on the central east coast of Queensland at latitude 23°51'S and longitude 151°16'E (Figure 8). Its natural harbour forms one of the largest and safest ports in Queensland. Gladstone is one of Australia's major coal exporting ports and is centrally situated to serve the rich mining areas of central Queensland[6].

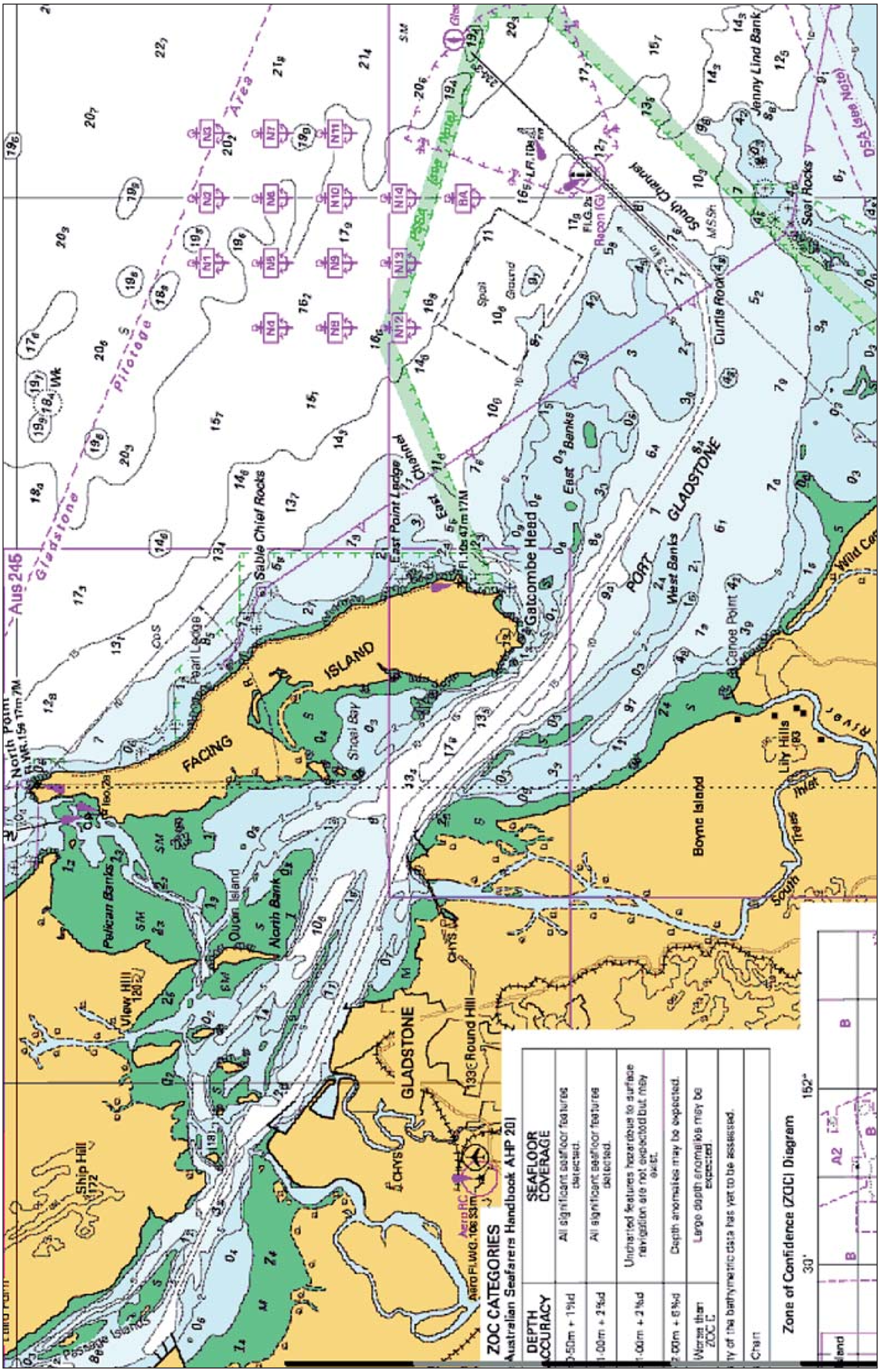
The eastern side of the harbour is formed by Facing Island which, except for its southern end, is low and thickly wooded. The northern side of the harbour is formed by the southern shore of Curtis Island which is moderately high and indented by shallow bays. The south western shoreline from the entrance to South Trees Point is low, sandy and wooded. From South Trees Point to Barney Point the shoreline is fronted by a drying mud bank. Most of the area from Barney Point west to the Auckland Point wharves and the Clinton Coal Terminal is reclaimed land. The city of Gladstone and all port facilities are on the southwest side of the harbour.

The harbour is entered through South and Gatcombe Channels leading from sea to the outermost berths at South Trees Point. From there Auckland, Clinton and Targinie Channels together lead nine miles further west-northwest giving access to the berths at Barney Point, Auckland Point, Clinton Wharf and Fishermans Landing.

The Clinton Channel leads northwest from its junction with the Auckland Channel abreast of Auckland Point to the Clinton Swing Basin and the three berths at the Clinton Wharf.

6 Australia Pilot Volume III, ninth edition 2002, page 164.

**Figure 8: Section of chart AUS245 showing Gladstone harbour**



## 3.4 The incident

*Global Peace* anchored off Gladstone at 0530 local time (UTC+10) on 14 January 2006 after a voyage from the port of Yeosu in Korea. The ship had de-ballasted prior to arriving at the anchorage and was due to load a cargo of coal at the Clinton Coal Terminal for export to Korea. The ship's arrival draughts were 7.82 metres forward and 7.95 metres aft.

During the afternoon of 24 January, Gladstone vessel traffic service (VTS) informed the master that a pilot would be boarding *Global Peace* by helicopter at about 2130 and that the ship would be berthing starboard side to, at Clinton number three (Figure 9). The weather on the evening of 24 January was fine and clear, with winds north to northeast force two to three (less than 10 knots). The sky was clear, but the evening was moonless, until moonrise at 0106 on 25 January. The ebb tide started at about 1630 and it was expected that it would be slack water by the time the ship reached the Clinton Swing Basin.

The ship weighed anchor at 2020 and proceeded to the pilot boarding ground. The pilot and check pilot boarded the ship two miles[7] from the pilot boarding ground at 2130, and they were escorted to the bridge.

After being presented with the passage plan by the pilot, the master, duty mate and pilot discussed the plan. The plan was a standardised Gladstone passage plan that had the details of this particular transit. It outlined the courses to be steered; when the crew would be required at stations; when tugs would be made fast; the swing of the ship in the basin; and the order in which the ship's mooring lines would be handled. All three men confirmed their agreement with the plan and acknowledged that they understood their responsibilities during the transit.

Following the discussion, the pilot assumed control of the ship, lined *Global Peace* up on the leading lights, and started to build up the ship's speed prior to entering South Channel. When the ship passed the fairway buoy, the engine telegraph was at navigation full ahead and the ship was making headway at about 11 knots.

As the ship entered the inner harbour the pilot reduced the ship's speed to ensure it was making good about eight knots on entering the Auckland Channel. He further reduced the ship's speed to six knots as *Global Peace* passed a ship alongside the Barney Point wharf.

Between 2310 and 2320 three tugs were made fast to *Global Peace*, each using the tow line on their forward winch. At the time the ship was passing the Auckland Channel number three beacon. The pilot ordered that the number one tug[8], *Bullara*, take up a position just forward of the port shoulder. He ordered *Wistari* to take up a position just aft of *Bullara* and for *Tom Tough* to take up a position on the port side aft. *Tom Tough*'s tow line was made fast to *Global Peace* through the ship's panama lead adjacent to the forward end of the number nine hatch on the port side of the ship as instructed. After taking up their positions the three tugs each payed out 25 to 30 metres of tow line and then lay alongside the ship.

7 One mile refers to one nautical mile or 1852 metres.

8 In the port of Gladstone tugs are referred to by number, with number one being the forward most tug. All communications between the pilot and the tugs make reference to the position number, not the tug's name.

**Figure 9: Section of chart AUS245 showing *Global Peace*'s track on 24 January**

When *Global Peace* entered the Clinton Channel, the pilot further reduced the ship's speed so it would enter the Clinton Swing Basin at about three knots.

When the ship was in position to swing (Figure 9), adjacent to Clinton berths one and two, the pilot ordered the forward tugs to 'push up' while the aft tug, *Tom Tough*, was ordered to 'pull the stern to port'. All three tugs were ordered to operate at 50 per cent thrust. The pilot used dead slow astern, and then slow astern main engine revolutions to assist with the turn.

The ship's swing was completed at 2350. It was apparent that the tide was slack as *Global Peace* was sitting stationary, roughly in the centre of the swing basin. The pilot ordered an ahead movement on the ship's main engine and used *Tom Tough* to push the stern to starboard, bringing the ship towards the line of the wharf.

As the ship moved forward towards the number three berth (the eastern most berth) the pilot ordered all three tugs to lie alongside the ship with weight off their tow lines. *Tom Tough*'s master laid his tug alongside and at an angle of about 15 degrees to the ship's side. He did this to keep the tug clear of the turn of the hull shell plating towards the ship's stern, as is usual tug practice. The tug's bow was in line with the front of the ship's accommodation. The tug master was alone on the bridge. The engineer and IR were in the tug's accommodation.

*Global Peace* started to move ahead and *Tom Tough* moved with it. The tug master held the main engine revolutions at idle (380 rpm) and set the uni-lever just forward of neutral. This enabled *Tom Tough* to maintain station with the ship while keeping weight off the tow line.

### 3.4.1 The collision

#### ***Tom Tough*'s master**

At about 2354 *Tom Tough*'s master felt the tug's stern swing sharply to starboard. The tug master checked the main engine tachometers and saw that they were both indicating idle revolutions. He scanned the console dials a second time and noticed the revolutions were falling away on the starboard main engine. He surmised that the starboard main engine was in the process of shutting down and that the loss of thrust from the starboard z-peller was causing the tug's stern to swing to starboard.

He de-clutched the port main engine. While he had reacted within a few seconds, he was too late. The tug's starboard quarter had already made heavy contact with the side of the ship, puncturing the ship's shell plating in way of the port deep fuel oil tank.

The tug master moved the uni-lever to a position that would have the effect of driving the tug astern and away from the ship. When the port z-peller was in position he clutched the port engine back in. The tug now moved clear of the ship. He then manoeuvred the tug forward and shortened the tow line.

With the tug now in a safe position he de-clutched the port engine and allowed the tug to hang on its tow line. He then switched on the starboard bridge flood light so he could see if the tug had been damaged. He then realised the extent of the collision. He could see a puncture in the ship's side and fuel oil flowing from it.

At about 2356, the tug master informed the pilot that one of *Tom Tough*'s main engines had failed and that the tug had collided with the ship, penetrating the ship's hull. He also informed the pilot that oil was flowing from the hole in the ship's hull into the harbour.

*Tom Tough* was unable to continue with the tow. At the completion of the ship's berthing the tug master took the precaution of seeking *Wistari*'s assistance in towing his vessel back to its berth.

### *Tom Tough*'s engineer

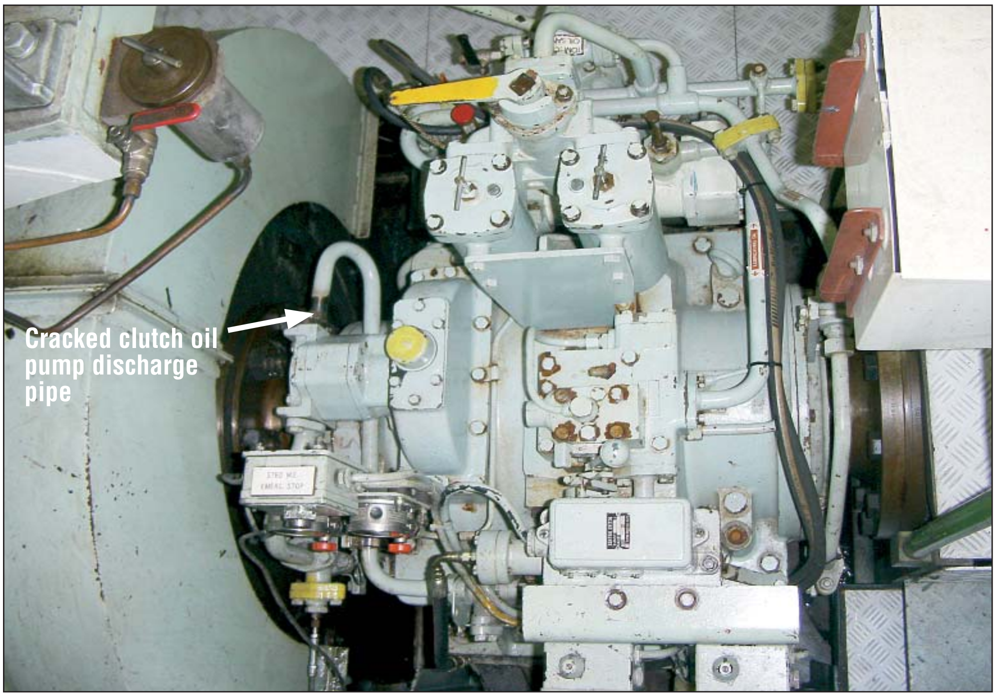
On hearing an alarm coming from the engine room at about 2354, the engineer left the tug's mess room and went directly to the engine room to investigate. On his arrival he noted a series of starboard main engine failure alarms, and could hear the starboard main engine slowing down. It was immediately apparent that an engine trip had been activated, but it was not obvious what had caused it.

The engineer accepted the alarms, which cancelled the alarm sounder, then carried out an inspection of the starboard engine. He found a large quantity of oil in the area surrounding the clutch. It was not evident where the oil had come from, but when he checked the clutch sump he found it was empty.

The IR joined the engineer in the engine room, and was asked to re-fill the clutch sump. The engineer continued to search for the leak and then carried out a full inspection of the engine.

When the clutch sump was full the engineer started the starboard main engine while the IR stood by the clutch housing. Oil immediately started to spray from a crack in the clutch oil pump discharge pipe (Figure 10). The engineer stopped the engine after receiving the signal to do so from the IR.

**Figure 10: *Tom Tough's* Starboard main engine clutch housing**



After inspecting the crack the engineer informed the master of the fault and also told him that nothing could be done to rectify the problem until the tug returned to its berth.

After the tug returned to its berth *Tom Tough*'s engineer weld-repaired the cracked clutch oil pipe. By about 0417, *Tom Tough* had completed engine trials and VTS was informed that the tug was ready to undertake towage operations.

#### *Global Peace*

At 2354, with *Global Peace*'s bridge in line with the bow of the ship at the number two berth, all those on the ship's bridge heard a loud crashing sound followed by a shudder of the ship.

As soon as the tug master had informed the pilot of what had happened, the pilot informed VTS and suggested that they initiate the oil pollution plan. He then left the ship's master to investigate the damage to the ship and the check pilot to assist the master with communications via a mobile telephone.

The pilot thought it was prudent to continue with the berthing operation because of the ship's position in the channel, but as *Tom Tough* could not continue the tow, the pilot asked *Wistari* to move aft and take up a position just forward of *Tom Tough*.

The ship's master and the check pilot went to the port bridge wing but they could not see anything in the darkness. The master made radio contact with the second mate, who was stationed aft, and asked him what had happened. The second mate informed him that the tug had collided with the ship and there was oil all over the tug, and in the water. The second mate could not see where the oil was coming from.

The ship's crew could not mount an immediate clean up response because they were engaged in the berthing of the ship.

From his investigations the master determined that the port deep fuel oil tank had been holed. At 0005 on 25 January, he telephoned the engine room and requested that the chief engineer transfer the fuel oil remaining in the port deep fuel oil tank to the number five double bottom fuel tank. The fuel transfer pump was lined-up and the transfer started. Fuel stopped flowing into the harbour at about 0040 but the transfer of fuel continued until the port deep fuel oil tank was empty.

The ship's first mooring line was ashore at 0015 on 25 January and the ship was all fast by 0050. By 0100 the pilot had stood down all three tugs and informed VTS that the ship was all fast.

### 3.4.2 The damage

The hole in *Global Peace*'s port deep fuel tank (Figure 11) was about one metre above the ship's water line, just aft of the forward face of the accommodation, between frames 42 and 43. The hole was 300 mm long and 100 mm wide and roughly in the centre of an area of plating measuring 650 mm by 250 mm, that had been set in by about 50 mm.

The damage sustained by *Tom Tough* in the collision included the tripping of a number of frames supporting the starboard quarter bulwark (Figure 12), deformation of the bulwark just forward of the starboard quarter fender and a broken aft fender retaining chain.

**Figure 11: Damage to *Global Peace*'s hull**

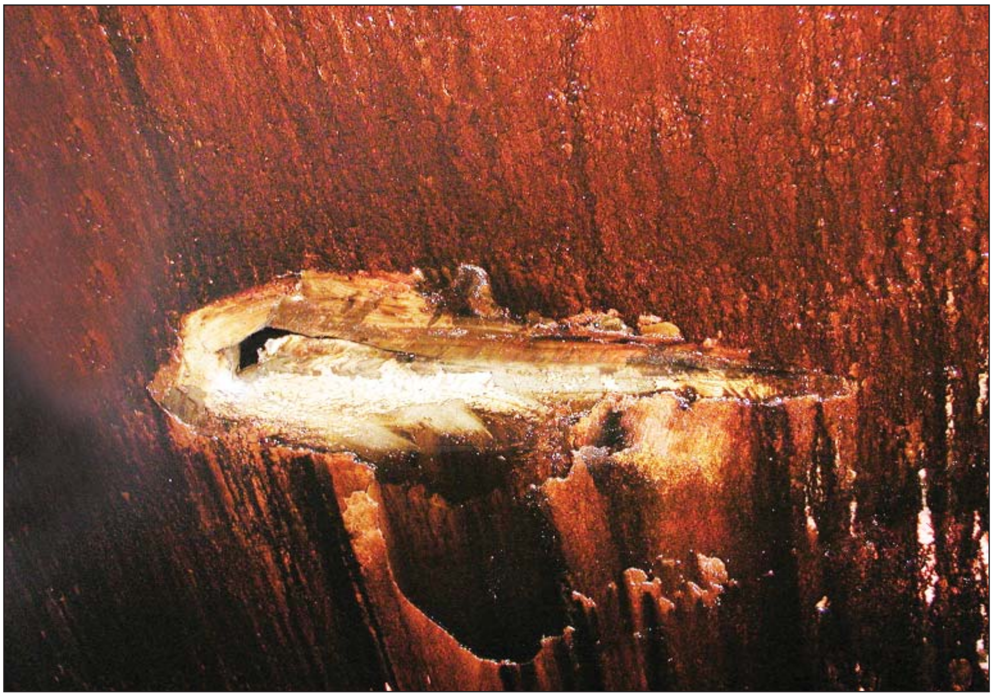
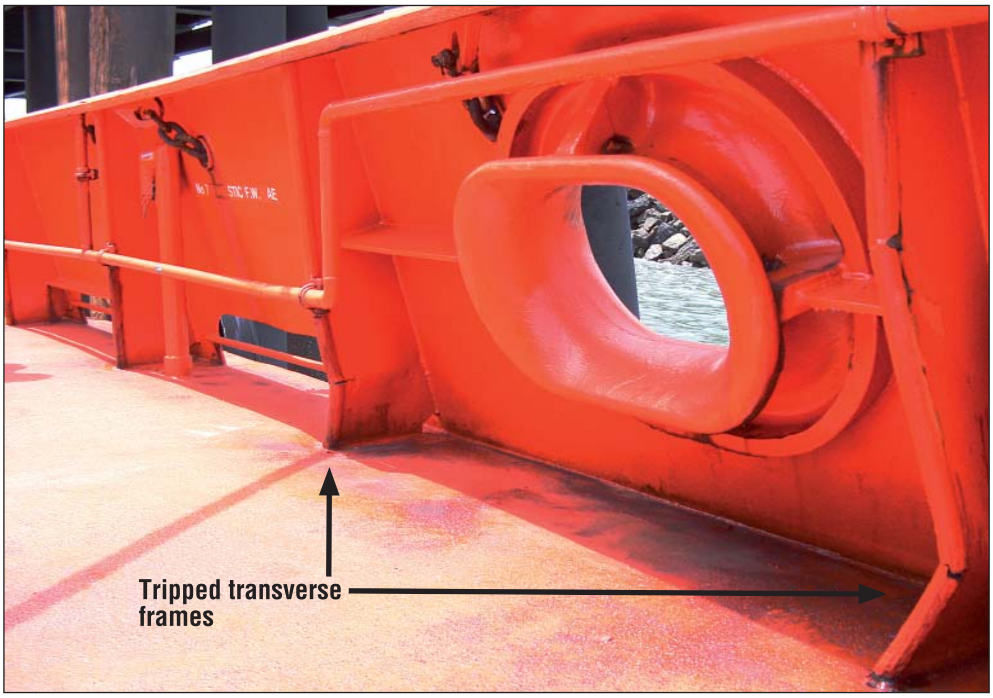


**Figure 12: Damage to *Tom Tough***



### 3.4.3 The oil spill

Heavy fuel oil flowed into Gladstone harbour from the hole in *Global Peace*'s port deep fuel tank for about 45 minutes. It was later estimated [9] that 25 cubic metres of heavy fuel oil escaped from the ship into Gladstone Harbour.

The port's emergency response was initiated immediately and the ensuing clean up started at first light on 25 January, and continued for the next seven days.

9 Estimate made from the ship's bunker sounding records and measurements taken after the incident by an independent surveyor.

# 4 COMMENT AND ANALYSIS

## 4.1 Evidence

Between 25 and 28 January 2006, investigators from the Australian Transport Safety Bureau (ATSB) attended *Global Peace* and *Tom Tough* in Gladstone. The masters and directly involved crew members were interviewed, and they provided accounts of the incident. Copies of relevant documents were obtained, including log book entries, procedures and statutory certificates.

The investigators carried out an examination of the damage sustained by both vessels, interviewed the pilot, and gathered evidential material from Gladstone VTS. They also attended the regional harbour master's oil spill response situation report meetings.

It is desirable that evidence is not interfered with after an incident has occurred. In this instance *Tom Tough*'s engineer needed to repair the cracked clutch oil pump discharge pipe so the tug could return to towage operations. He did however take photographs of the pipe both before and during the repair process and these photographs were of great assistance to the investigators.

## 4.2 *Tom Tough*'s z-peller system

The operating principle of *Tom Tough*'s z-peller stern drive relies on the balance of propeller thrust being maintained to provide directional stability, particularly when the tug is being manoeuvred at low speeds. The loss of an engine in these circumstances results in an almost immediate loss of control.

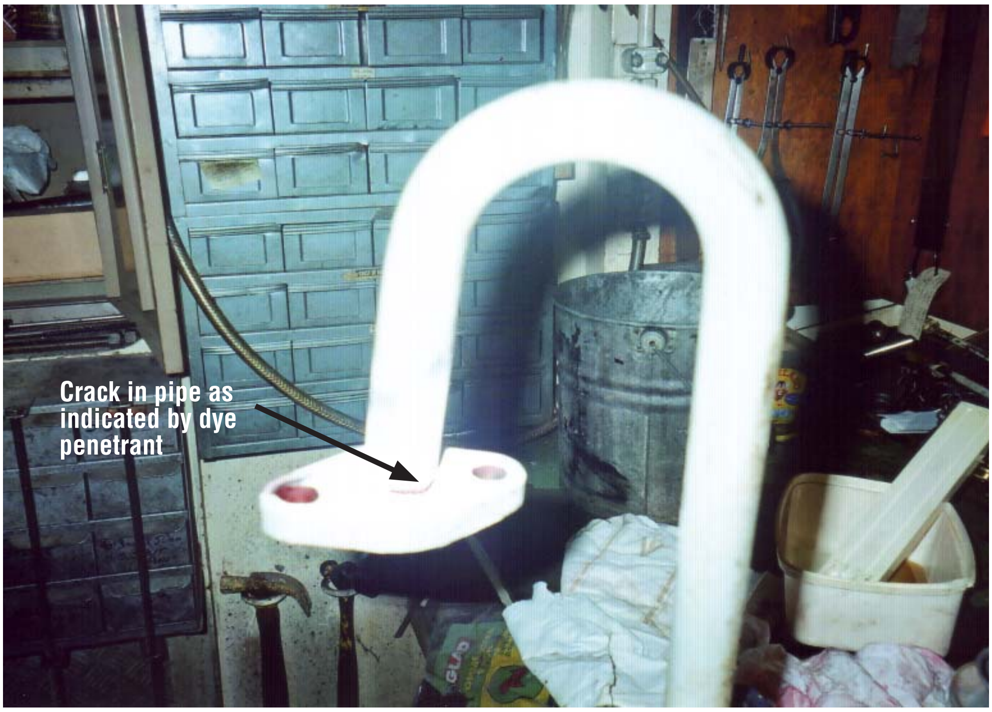
On 24 January, just prior to the collision, the tug master had the main engine revolutions for both engines set at idle and the uni-lever set just forward of the neutral position. This had the effect of steering the tug straight ahead and at a speed of one to two knots, the same speed as the ship. With the uni-lever in this position the thrust from each of the propellers was directed outwards and about five degrees aft. Consequently most of the force being generated from each propeller was directed towards the centreline of the tug.

When the starboard main engine shut down, the balance of thrust between the two propellers was lost. The force being generated by the port propeller, the only propeller still producing thrust, caused the tug's stern to swing sharply to starboard.

## 4.3 Clutch oil pump discharge pipe failure

Shortly before 2354 on 24 January the starboard main engine clutch oil pump discharge pipe cracked (Figure 13). The leakage of oil from the system through the crack lowered the oil level in the clutch sump. The loss of oil ultimately led to the loss of pump suction and the resultant loss of pump discharge pressure. Eventually the oil discharge pressure dropped to a point where it activated the low clutch oil pressure alarm and then the low clutch oil pressure engine shutdown.

**Figure 13: Cracked clutch oil pump discharge pipe**




When the engineer reached the engine control room there were a number of starboard main engine alarms flashing. It is likely that the alarm the engineer responded to was the low clutch oil pressure alarm, and that by the time he had arrived in the engine room (within 10 seconds of hearing the alarm) the clutch oil pressure had fallen sufficiently to activate the engine shutdown. The other alarms that were flashing were probably a consequence of the shutdown.

The clutch oil pump discharges at a pressure that is controlled between 12 and 14 $kg/cm^2$ by a pressure control valve. The oil that is excess to the requirements of the clutch hydraulic circuit is used for lubrication, and is fed to the clutch and intermediate shaft bearings. This lubrication system operates at about 2.5 $kg/cm^2$ and is monitored by a low pressure alarm and a low pressure engine shut down.

It is probable that the pressure in the lubrication circuit did not fall to the alarm set point (0.4 $kg/cm^2$) until the pump lost suction, and that the engine shutdown (set at 0.22 $kg/cm^2$) would have been activated a short time later.

The clutch protection circuit operated as it was designed; it protected the clutch and the intermediate shaft bearings from a loss of lubrication. However, the design of the system gave *Tom Tough*'s crew no early warning of the loss of oil. Had the clutch oil sump been fitted with a low level alarm the crew would have been given a warning that may have afforded them enough time to take action to stop the engine in a more controlled manner and thereby prevent the collision.

The crack in the clutch oil pump discharge pipe progressed quickly and when repaired was found to measure about one half of the pipe's circumference. This meant that the entire sump, about 50 litres of oil, would have been lost in a relatively short period of time. The crack was in the heat affected zone adjacent to the fillet weld at the pump discharge end of the pipe (Figure 13) and was probably a result of cyclic fatigue. While there are no excessive vibrations in *Tom Tough*'s engine room, this particular pipe is subject to the pressure pulsations emanating from the clutch oil pump (gear type pump). It is probable that the number of pressure pulses (cycles) that this pipe had been subjected to over its 23 year service life caused the pipe's fatigue and eventual failure.

*Tom Tough*'s operators commissioned the School of Mechanical Engineering at the University of Adelaide to test the clutch oil pump discharge pipes fitted on the tug's port and starboard main engines, and to report on their findings. The conclusions of that report are as follows:

- The pipe can be subjected to severe vibration if the support clamps are loose.
- The pipe material and fillet welding produce a section which will allow fatigue to initiate and propagate in the region of the toe of the fillet weld.

## 4.4 Maintenance

The clutch oil pipes were not subjected to any routine maintenance other than visual inspection.

The manufacturer's instruction manuals did not suggest a need for the inspection of the clutch oil pump discharge pipe, or other pipes in the clutch oil circuit, and *Tom Tough*'s planned maintenance system did not call for any specific inspection or non destructive testing of the pipe. However, the clutch oil system was visually checked each time the engine was run up, as it was at about 2200 on 24 January.

There had been a failure of the clutch oil pump discharge pipe serving the same purpose on the port main engine in February 2002. The pipe fitted to the port engine had also cracked adjacent to the pump and in an identical way to the starboard pipe failure. At the time, the pipe was temporarily repaired by the tug's engineer and two weeks later a permanent repair was carried out by a Gladstone based engineering firm.

While the engineer on duty in February 2002 recalls inspecting the clutch oil pump discharge pipe fitted to the starboard engine at the time that the pipe fitted to the port engine failed, there is no record of the inspection in the engineer's log or the monthly report, and no communication from the technical department requesting such an inspection.

*Tom Tough*'s engineers are required to record maintenance tasks in a daily log format, and to forward a monthly report to the shore side technical staff for review and follow up. The inspection of a pipe fitted to a critical piece of equipment, such as a main engine clutch, which was prompted by the failure of a similar component, is more than a routine maintenance task. It is fair to expect that such an inspection would generate a report, and that the technical department would probably forward an appropriate reply.

In relation to the lack of records pertaining to the starboard pipe inspection in February 2002 Adsteam Harbour stated:

> In the absence of a finding suggestive of a fault, that check would not normally be recorded or documented.

There seems to have been little consideration given to the fact that both pipes were exposed to the same service conditions. The operators of *Tom Tough* had given no apparent thought to the possibility of fatigue related failures after the failure of the clutch oil pump discharge pipe fitted to the port main engine. Had the clutch oil pipe fitted to the starboard engine been replaced or strengthened, the failure of the pipe on 24 January 2006 may have been avoided.

In submission Adsteam Harbour stated:

> While it is understood that the cause of the pipe failure may have been fatigue related, it is relevant and should be noted that:
>
> - The pipe was factory fitted to the clutch;
> - The manufacturers information does not suggest the pipe should be the subject of planned maintenance, whether by way of periodic inspections or otherwise, or that it had a particular life;
> - The manufacturer has never published an alert or service bulletin suggesting a serviceability issue with this component;
> - Recent enquiries with the manufacturer reveal no history of similar failures;
> - A study conducted by the University of Adelaide suggests that there were design inadequacies with the pipe, in particular the weld specification.
>
> Therefore it cannot be reasonably contended that the risk of fatigue failure should have been identified and addressed in planned maintenance.

While the basis for any planned maintenance system should be manufacturer supplied information; every operator should also learn from their experience and develop their maintenance system over time. *Tom Tough* had experienced a previous clutch oil pipe failure prior in February 2002, but the towage company had not implemented changes to the vessel's maintenance programme. It is also of note that the towage company had not informed the clutch manufacturer of the earlier failure.

## 4.5 *Tom Tough*'s starboard quarter fender

*Tom Tough* was fitted with a single tubular rubber fender that covered the starboard quarter of the vessel. The fender was designed to protect the tug and the ship in the event of contact. It was held in place by a chain through its centre and was retained snugly to a support beam by a series of retaining chains (Figures 14 and 15). The fender was also designed to give some protection to the support beam, and hence was longer than the beam. Over a period of time the fender had moved aft, probably due to a number of previous contacts, and thus did not give the support beam the protection it required (Figure 15). The fender had also deteriorated due to its exposure to the weather and operational conditions over time. Consequently the fender had not retained its original resilience.

At the time of the impact a combination of the shape of *Global Peace*'s shell plating at the point of impact due to the turn of the hull shell plating towards the ship's stern, the heeling of the tug as it swung to starboard, and the force of the contact between the tug and the ship compressed the fender and pushed it downwards.

This resulted in the corroded, and thus already weakened, forward most retaining chain breaking under the strain. The fender was then free to move down, exposing the forward corner of the fender support beam. It was the exposed corner of the support beam that made heavy contact with *Global Peace* and punctured the ship's shell plating.

The design of the fender retaining beam was deficient. The exposed end of the beam was finished with a square, almost sharp, corner (Figure 14). There is no reason for the exposed corner to be the shape that it was. If the end of the beam had been rounded it would not have diminished the functionality of the beam, but it may have reduced the damage that resulted from the collision.

**Figure 14: *Tom Tough*'s starboard quarter fender**

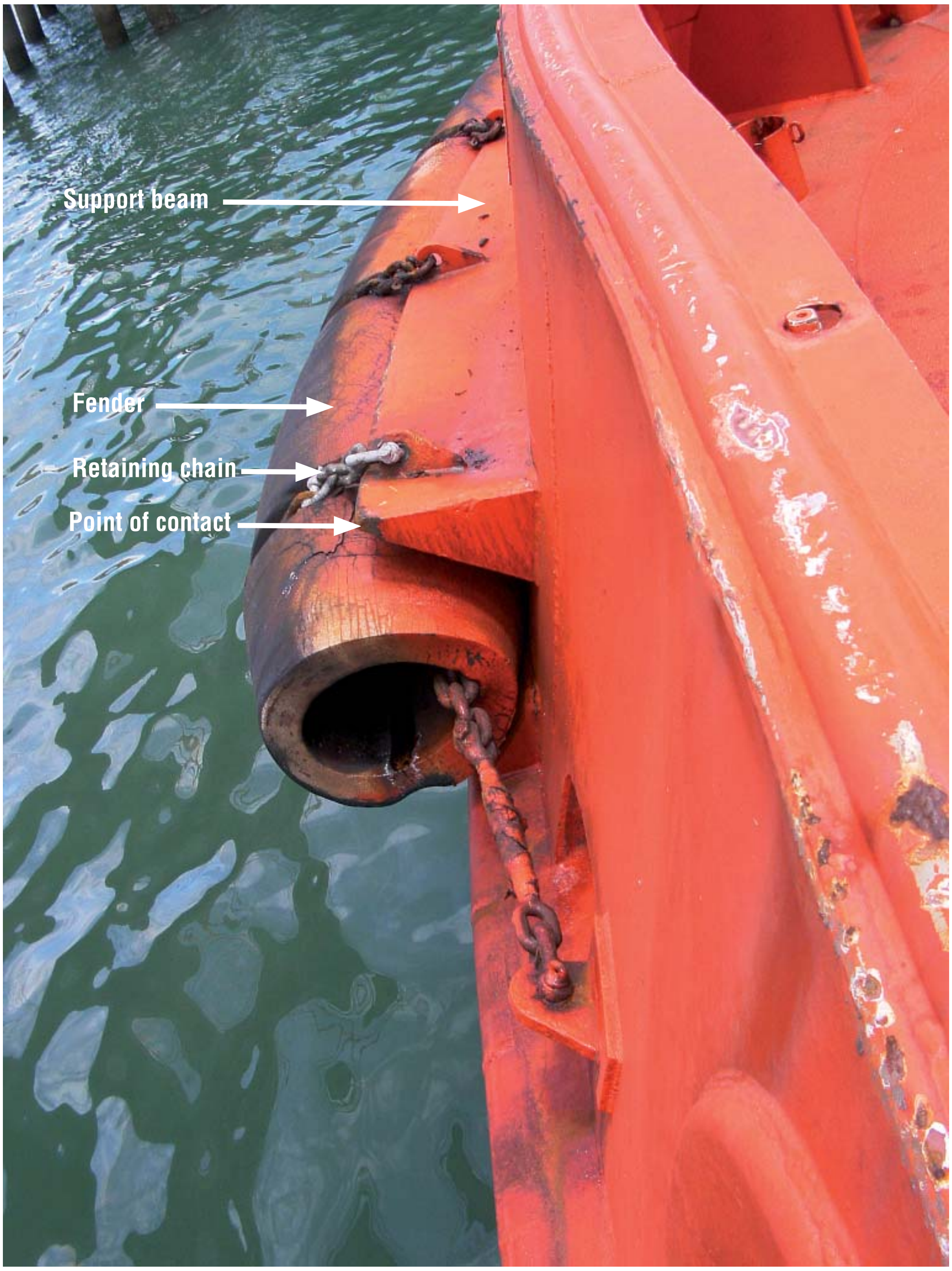


**Figure 15:** ***Tom Tough*****'s fender showing that it had moved aft**


## 4.6 The tug master's response to the engine shutdown

At about 2354 on 24 January the starboard main engine clutch oil low pressure alarm activated and this alarm was followed a short time later by the starboard main engine shutdown alarm. The engine shut down and subsequently de-clutched, causing the tug's stern to swing sharply to starboard. The tug master noticed the tug swinging to starboard and reacted by de-clutching the port engine, however the tug had already collided with the ship. The tug master estimates that the collision occurred within five seconds of him noticing the tug swinging to starboard.

*Tom Tough*'s machinery alarms activate simultaneously in the engine room and on the bridge. On 24 January when the engineer accepted the engine room alarm and thus cancelled the engine room sounder, he also cancelled the bridge sounder. The alarm on the bridge probably sounded for less than ten seconds. After this time the lights on the alarm panel indicating starboard main engine critical alarm and starboard main engine shutdown would have remained illuminated.

The master stated that he did not hear or see an engine alarm prior to the tug's stern swinging to starboard. It is possible that he was so focused on the control console, and what was happening to the tug, that he didn't notice any alarms.

The engine room alarm panel is mounted below knee level, to port and behind the tug master's operating position in the wheelhouse. If the alarm sounder and indicator lights had been fitted within the tug master's field of view it is possible that he may have been alerted to the failure earlier. This may have led to an earlier response.

Given the tug's proximity to the ship and the limited time in which the tug master had to react it is likely that it was not possible for him to react quickly enough to avoid the collision. But if he had responded to the alarm, rather than the movement of the tug, the consequences of the collision may have been reduced.

### 4.6.1 Alertness and fatigue

Even with the tug master's experience it would have been difficult to notice the initial movement of the tug when the starboard main engine shutdown occurred. He was operating in almost total darkness with no deck lighting or moon light. *Tom Tough* was alongside a very large dark object, the ship. He was looking forward and apart from the tow line he had very few objects to use for reference. Had the collision occurred in daylight hours the tug master may have been more aware of the initial movement of the tug.

Fatigue is not considered to have been a factor in this incident. While the collision occurred at about midnight on 24 January, *Tom Tough*'s tug master had ample periods of rest in the days before. He had returned to work on the night shift on 17 January after a period of 24 days leave. On 24 January he was completing the last in a cycle of eight, twelve hour on call, night shifts. He had worked about 43 hours over the preceding seven nights, and prior to starting work on 24 January, he had a break of about 20 hours.

### 4.6.2 Professional development

On starting with the company appropriately qualified trainee tug masters are required to undergo on the job training before undertaking towage operations. The training process is carried out in-house by experienced tug masters, who pass on their knowledge and experience. The trainee tug master is also issued with a 'Tug Master's Training Manual' which describes the effective use of omni-directional stern drive tugs.

The training process takes 12 weeks, and at the end of this period an assessment of the new tug master's capabilities is carried out by an independent senior tug master from within the fleet.

After the initial training the tug masters undertake no ongoing professional development. The towage company does not utilise simulators or practical emergency manoeuvring training and there is no process of skill review. The only time that a tug master's skills might be reassessed is when a tug is involved in an incident.

The towage company has no procedures that outline the correct action to be taken by a tug master in the case of an engine failure. The only defence mechanism is the tug master's knowledge and skill.

*Tom Tough*'s master was suitably qualified and very experienced in the operation of z-peller tugs. But he was given little guidance and no ongoing professional development in the area of emergency manoeuvring procedures.

This collision is not an isolated incident. Eleven collisions involving tugs have been reported to the ATSB since 1991. In the investigation report into the collision between the tug *Redcliffe* and the container ship *Ariake* in January 2000, the ATSB concluded that further training was indicated for tug masters in emergency procedures.

While this incident occurred with little warning and the tug master had limited time in which to respond, the event itself, the failure of an engine, is foreseeable.

Professional development that would consider such foreseeable events involves more than just teaching someone a skill. An effective programme would include an analysis of the risks involved in carrying out each task. The risk analysis should be carried out by experienced personnel looking at routine operations and past incidents, with the aim of developing strategies, procedures and scenario training that could be implemented across the fleet. This process should evolve over time and be used to continuously develop and improve tug master performance.

## 4.7 *Tom Tough*'s engine room monitoring

*Tom Tough*'s engineer was in the tug's accommodation when the clutch oil pipe failed on 24 January 2006. He had not been in the engine room for three quarters of an hour prior to the collision.

The towage company's procedures required the engineer to carry out an inspection of the engine room prior to the tug starting towage operations, and then be available to assist on deck. It was the tug master's policy for the engineer and IR to remain in the accommodation when not carrying out tasks on deck. This gave the tug master the security of knowing where they were, and the ability to call them quickly if he required their assistance. During towage operations the tug master, engineer and IR remain in contact at all times via ultra high frequency (UHF) radios.

The involvement by the engineer in deck operations, normally for short periods of time, has led to a system whereby the engineer tended to remain outside the engine room even when not engaged in these operations. It is possible that the crack in the clutch oil pump discharge pipe would have been detected if the engineer had been in the engine room. He would probably have seen or smelled the leaking oil within the confines of the relatively small engine room. Having detected the leak he may have been able to notify the tug master, and the engine could have been shut down in a controlled manner, rather than the uncontrolled auto shut down which led to the collision.

In submission Adsteam Harbour stated:

> There is an underlying premise to this implication, namely that there is no risk to the safety of the engineer in towage operations of this nature if he remains in the engine room whenever possible.....
>
> An objective reader in management within this industry might read this part of the report and reasonably conclude that notwithstanding a capacity to operate an unmanned engine room space and appropriate procedures for start up, pre towage and periodic inspections, the engineer should remain in the engine room during towage whenever possible.

There are times during a towage operation when it can be considered unsafe for the engineer to be in the engine room; however these periods generally coincide with definable operations. While *Tom Tough*'s procedures did not preclude the engineer from inspecting the engine room during towage operations, they did not stipulate that he should carryout frequent inspections, when it was safe to do so.

The classification society's ACCU notation allows the propulsion machinery space to be controlled and monitored from the navigation bridge. The notation indicates that the running machinery can be operated with the engine room periodically unmanned. However, this does not prevent an operator from carrying out their own risk analysis and implementing procedures and practices that introduce a more comprehensive monitoring regime.

## 4.8 *Global Peace*'s deep fuel oil tanks

The location of *Global Peace*'s port and starboard deep fuel oil tanks is typical of many bulk carriers, as is the construction, which relies on the ship's shell plating to form the outboard boundary of the tank. The location of tanks in this manner means that they are unprotected from external forces or impact, and thus if the tank is ruptured, its contents are free to flow out from the tank.

While oil tankers constructed today are required to be double hulled [10], it is still common for a bulk carrier's fuel oil tanks to be located and constructed in a similar manner to those on board *Global Peace*.

An amendment to the revised MARPOL [11] Annex I (which was adopted in October 2004 with entry into force set for 1 January 2007) includes a new regulation on oil fuel tank protection. The regulation is intended to apply to all ships delivered on or after 1 August 2010 with an aggregate oil fuel capacity of 600 cubic metres and above. It includes requirements for the protected location of the fuel tanks and performance standards for accidental oil fuel outflow. The changes to MARPOL are significant and will assist in reducing the probability of an oil spill, however the full effect of these changes will not be seen until the majority of the current international fleet of ships have ceased trading.

## 4.9 *Global Peace*'s response

The ship's master was alerted to the oil spill at 2356 on 24 January. It then took him nine minutes to establish that the oil was coming from the port deep fuel oil tank, and to formulate a response.

At 0005 on 25 January the master requested that the chief engineer transfer the remaining oil in the port deep fuel oil tank to the number five double bottom tank.

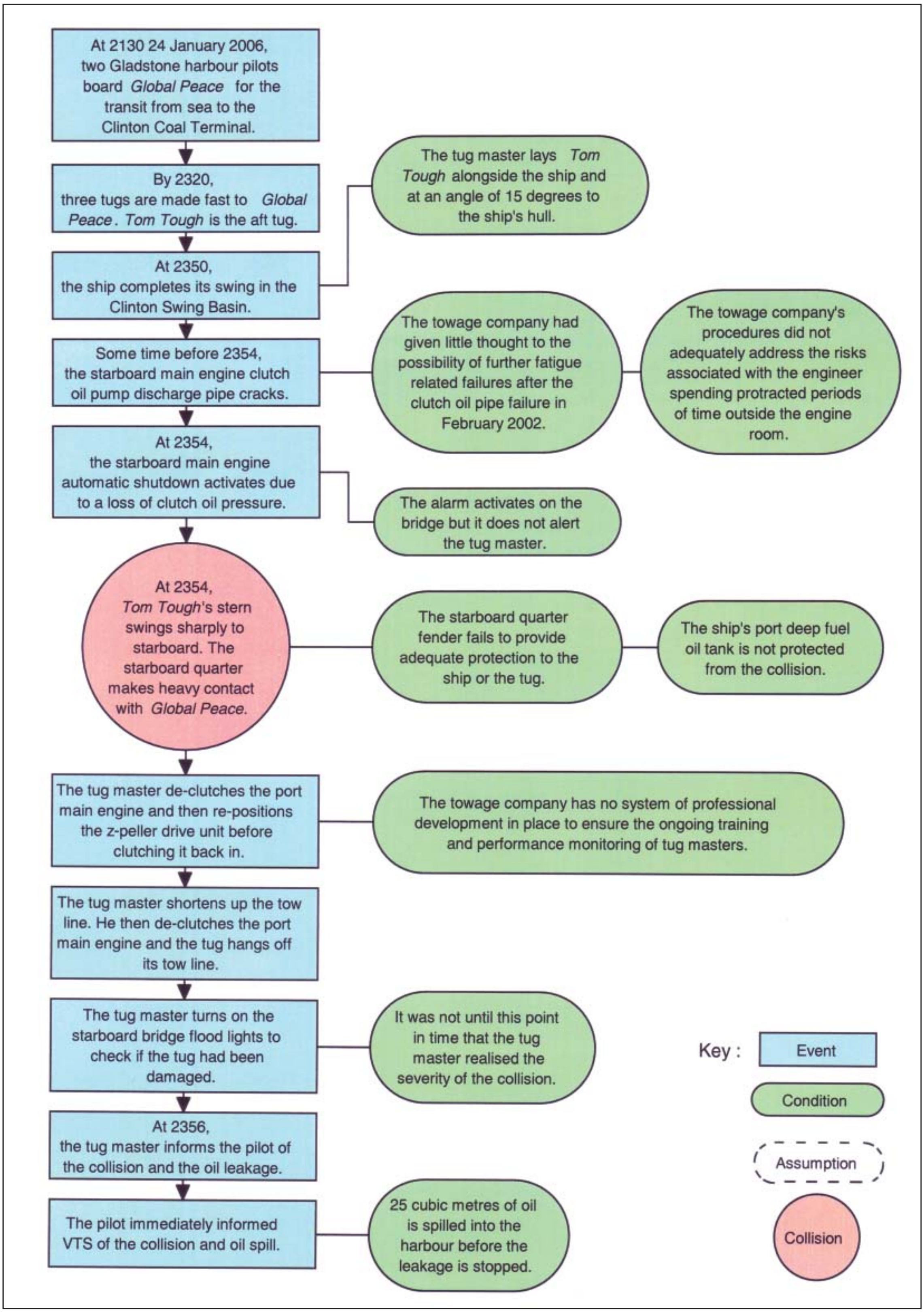
The oil stopped flowing from the port deep fuel oil tank at 0040, 35 minutes after the fuel oil transfer had begun. It is estimated that in this period of time about 25 cubic metres of oil was transferred from the tank, thus reducing the amount of oil that escaped from the ship.

---

10 Oil tankers above 5 000 tonnes deadweight are required to have double hulled construction. The cargo oil and fuel oil tanks are separated from the ship's shell plating by a series of void spaces.

11 International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78).

**Figure 16: Events and causal factors chart**



# 5 CONCLUSIONS

These conclusions identify the different factors that contributed to the accident and should not be read as apportioning blame or liability to any particular individual or organisation.

Based on the available evidence, the following factors are considered to have contributed to the collision between the tug *Tom Tough* and the bulk carrier *Global Peace* on 24 January 2006, and the oil spill that occurred as a result of the collision.

1. The failure of the starboard main engine clutch oil discharge pipe resulted in the system being emptied of oil. The resultant loss of system pressure activated the engine shutdown.
2. When the starboard main engine shut down, the tug's stern swung sharply to starboard and the tug's starboard quarter made heavy contact with the ship.
3. The tug's aft fender arrangement did not provide adequate protection to the tug or the ship.
4. The towage company had given little thought to the possibility of further fatigue related failures after the failure of the clutch oil pump discharge pipe fitted to the port main engine in February 2002.
5. The towage company's procedures and associated risk analysis had not adequately addressed the risks associated with the engineer spending protracted periods of time out of the engine room, and thus being unable to actively monitor the running machinery.
6. The activation of a critical alarm did not alert the tug master to the starboard main engine shutdown. Had the alarms alerted him it may have given him more time in which to take action.
7. *Global Peace*'s port deep fuel oil tank was 'unprotected', and thus when the shell plating was punctured the tank's contents were free to flow into the harbour.

It is also considered that:

1. The towage company had no system of professional development in place to ensure the ongoing training and performance monitoring of their tug masters.

# 6 SAFETY ACTIONS TAKEN

The ATSB has been advised that the following safety actions have been taken by Adsteam Harbour as a result of the collision between *Tom Tough* and *Global Peace*, the investigation of the collision and the release of recommendations in the ATSB's draft investigation report.

1. An email was sent to all fleet managers reporting the failure of the clutch lubricating oil pipe on *Tom Tough* and requiring that immediate steps be taken to inspect all similar pipes for signs of similar failure or previous repairs and report back to the national fleet and operations manager.
2. The School of Mechanical Engineering at the University of Adelaide was commissioned to investigate and report on the causes of the clutch oil pipe failure and to suggest any changes to the design and construction that might address such causes.
3. The decision has been made to replace both port and starboard pipes on board *Tom Tough* and all vessels fitted with the same model of clutch with the new modified pipe design.
4. All vessels in the fleet with similar fendering systems have been identified and a protective block has been designed for fitment to the sponson forward of the quarter fender.

# 7 RECOMMENDATIONS

**MR20060029**

Adsteam Harbour should review their current maintenance and reporting systems with a view to implementing procedures that consider the causes of failures and the likelihood and risks associated with similar failures in the future.

**MR20060030**

Adsteam Harbour should carry out an assessment of the risks associated with the engineer being in the engine room during various stages of towage operations, with a view to developing procedures and practices to ensure the running machinery is more actively monitored.

**MR20060031**

Adsteam Harbour should review the alarm and monitoring systems fitted on board *Tom Tough*, and similar tugs in their fleet, with a view to ensuring that the alerting of tug masters to critical alarms is adequate.

**MR20060032**

All owners and operators of tugs should consider carrying out a risk analysis of their towage operations with a view to implementing a system of ongoing professional development and training in emergency procedures for their tug masters.

# 8 SUBMISSIONS

Under Part 4, Division 2 (Investigation Reports), Section 26 of the *Transport Safety Investigation Act 2003*, the Executive Director may provide a draft report, on a confidential basis, to any person whom the Executive Director considers appropriate. Section 26 (1) (a) of the Act allows a person receiving a draft report to make submissions to the Executive Director about the draft report.

The final draft of this report was sent to the master, second mate and ship manager of *Global Peace*, the master, engineer and managers of *Tom Tough*, the P&I representatives of both vessels, the pilot, the regional harbour master and the Australian Maritime Safety Authority.

Submissions were included and/or the text of the report was amended where appropriate.

## 9 *GLOBAL PEACE*

| | |
|---|---|
| IMO Number | 8005082 |
| Call sign | H8CJ |
| Flag | Panamanian |
| Port of Registry | Panama |
| Classification society | Korean Register of Shipping |
| Ship Type | Bulk carrier |
| Builder | Mitsui Engineering and Shipbuilding |
| Year built | 1982 |
| Owners | Giant Marine Shipping |
| Ship managers | Korea Marine |
| Gross tonnage | 67 727 |
| Net tonnage | 42 509 |
| Deadweight (summer) | 132 049 tonnes |
| Summer draught | 16.79 m |
| Length overall | 263.00 m |
| Length between perpendiculars | 253.02 m |
| Moulded breadth | 42.07 m |
| Moulded depth | 22.81 m |
| Engine | Mitsui B&W 6L80GFCA |
| Total power | 13 500 kW |

# 10 *TOM TOUGH*

| | |
|---|---|
| IMO Number | 8112419 |
| Call sign | VJTF |
| Flag | Australian |
| Port of Registry | Gladstone |
| Classification society | American Bureau of Shipping |
| Ship Type | Z-peller tug |
| Builder | Carrington Slipways |
| Year built | 1983 |
| Owners | Adsteam Harbour |
| Ship managers | Adsteam Gladstone |
| Gross tonnage | 396 |
| Net tonnage | 117 |
| Deadweight (summer) | 368 tonnes |
| Summer draught | 4.94 m |
| Length overall | 33.91 m |
| Length between perpendiculars | 29.67 m |
| Moulded breadth | 11.10 m |
| Moulded depth | 5.41 m |
| Engine | 2 x Daihatsu 6DSM-28 |
| Total power | 2 650 kW |
| Bollard pull | 46 tonnes |

# 11 MEDIA RELEASE

## Oil spill in Gladstone harbour the result of a tug/ship collision

An Australian Transport Safety Bureau (ATSB) investigation found that the collision between the Australian registered tug *Tom Tough* and the Panamanian registered bulk carrier *Global Peace* resulted in a spill of approximately 25 cubic metres of oil in Gladstone Harbour on 24 January 2006.

At about 2130 on the evening of 24 January, *Global Peace* entered Gladstone harbour for the transit to the Clinton Coal Terminal. The plan was for the ship to berth at Clinton number three berth with the assistance of three z-peller tugs.

As the ship was approaching the berth, the pilot asked all three tugs to stop pushing and to lay alongside. The master of the aft tug, *Tom Tough*, laid the tug alongside the ship, with the tug at an angle of about 15 degrees to the ship's side. The tug's bow was in line with the front of the ship's accommodation.

At about 2354, *Tom Tough*'s starboard main engine unexpectedly shutdown. The tug's stern swung sharply to starboard and the starboard quarter made heavy contact with the side of the ship, piercing the ship's shell plating.

The tug had punctured the ship's port heavy fuel oil tank. Oil immediately began to flow into the harbour. The flow of oil continued for about 45 minutes.

According to the ATSB investigation report, a cracked starboard main engine clutch oil pipe resulted in the tug's clutch system being emptied of oil. The resultant loss of system pressure activated the main engine shutdown.

The report concludes that the tug's procedures and associated risk analysis had not adequately addressed the risks associated with the engineer spending protracted periods of time out of the engine room, the engine room alarm and monitoring system did not adequately alert the tug master to the engine shutdown, and the towage company had given little thought to the possibility of further fatigue related failures after the failure of the clutch oil pump discharge pipe fitted to the port main engine in February 2002.

The investigation also found that the tug's aft fender arrangement did not provide adequate protection to the tug or the ship and that the ship's port deep fuel oil tank was not protected from a collision.

The ATSB found that the towage company had no system of professional development in place to ensure the ongoing training and performance monitoring of tug masters.

The ATSB has made several safety recommendations with the aim of preventing further incidents of this type.

Independent investigation into the collision between the
Panamanian registered bulk carrier *Global Peace*
and the Australian registered tug *Tom Tough*
in the port of Gladstone, Queensland, 24 January 2006