Here comes the BOGEYMAN
KEITH INGRAM’S ‘STRAIGHT FROM THE HIP’ EDITORIAL

FIRE!
But no fixed means to fight it!

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Welcome once again to Lookout! – Maritime New Zealand’s new safety focused quarterly. Thank you all for your positive and constructive feedback on the first issue – from all accounts it was a sought after read by many of you.

This issue includes a ‘straight from the hip’ guest editorial by Keith Ingram. Keith, as many of you will know, is a professional mariner with some 40 years of sea-going experience operating all types of vessels. He is the publisher and editor of Professional Skipper, NZ Aquaculture and NZ Workboat Review magazines, and a well-known and respected member of our industry.

As illustrated by the stories in this issue, accidents are caused by a variety of factors. With a little foresight and planning, some of these could have well been avoided, whereas others would have occurred no matter how well prepared those involved were – yet had their reactions been different the outcome may well have been altered.

I am sure you will find this issue informative and thought provoking – do pass it on to your colleagues and crew or contact any one of our offices if you’d like more copies. The full accident reports are available on our website www.maritimenz.co.nz or by calling our toll free number 0508 22 55 22.

As always, we welcome your feedback on Lookout! and its content.

Russell Kilvington
Director of Maritime New Zealand
It won’t happen to me!—is a general feeling of complacency that surrounds the maritime industry. Unfortunately all to often Mother Nature proves us wrong as the facts demonstrate. As seafarers we continue to fail in a rare display of human weakness at the most inappropriate times.

Accidents, incidents and mishaps remain an unfortunate part of our everyday lives as we go about our business at sea. Sometimes they are the result of a calculated risk or a manoeuvre gone wrong. At others the cause may be incompetence or it may just be plain bad luck. Whatever the cause, the end result is that a report must be logged and invariably we receive a visit from the “Bogeyman” or in more correct terms the accident investigator.

It’s at this point where honesty is the best policy. Yeah right you say! Well yeah it is because the primary reasons for any investigation are two-fold:

1. To determine the nature and cause of an accident, incident, or mishap so we as an industry might learn from our mistakes. How often have we all thought, “But there’s the grace of God go I.”

2. To determine (and this is the more unpleasant aspect) if a non-compliant or negligent act was the cause, the outcome of which may result in a prosecution—hence, our fear of the “bogeyman.” It is this aspect of any investigation that brings out our best defences and our inability to recall the facts.

Which is why Maritime New Zealand has introduced a 3-tier reporting and investigating system. An excellent, proactive move where levels 1 and 2 involve investigations and reports, but only level 1 investigations may involve the issue of a caution and may lead to a prosecution.

For this new reporting system to work there must be a level of trust on both sides. If not the system will fail, and respect and credibility will be lost.

As an industry commentator I am frequently saddened to hear of yet another life lost or the demise of another fine vessel. Even the most respected and experienced seamen are coming to grief. Why can this be? Have we got to the stage where our industry is no longer financially viable, where the constant cost cuts are taking toll on training, maintenance and safety? Our fishing fleet is a sad reminder of the glorious days gone by, when fishermen could go to sea and make a quiet. Boats were well maintained and we took pride in them. The scruffy tired-looking vessels you see today are not just the preserve of the fishing industry alone. Look around our ports and it’s not hard to see vessels from all sectors in desperate need of a bit of TLC.

The words of my first-skipper still ring in my ears today: “She might be a fishing boat boy, but she don’t have to smell like one.” And he was not talking about his wife when he said, “It makes a man feel good to take the old girl out when she’s tarted up and looking a picture.”

We should all spend time doing touch ups and maintenance after each trip. By taking a bit of time small problems can be identified and fixed before they become a major, this lack of pride in ships husbandry cost driven and the first step towards complacency?

- Precautionary maintenance, safety drills and deck skills used to be part of our training. It was drummed into us so we knew what to do in that moment of panic: when things go wrong, don’t panic.

- How often do we think to do just that instead of losing momentum? It can make all the difference.

- Lives are at stake, ours included, and only training and good planning can reduce the odds in our favour.

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DUE TO AN OVERSIGHT, A NOTICE TO MARINERS, ADVISING OF THE CORRECT DEPTH CONTOURS, HAD NOT YET BEEN ISSUED.1

The pilot, who realised the vessel was at risk of grounding on the shoal ground, that lay adjacent to the vessel’s berth, decided it was best to continue with the turn as stopping the engine and coming astern would only worsen the situation.

While the vessel was about three quarters of the way through the turn to port, the bridge team realised the forward momentum of the vessel had stopped and she was aground.

With the use of her main engines and the assistance of the pilot boat, the vessel was refloated and safely made fast alongside the berth.

A deep-sea factory trawler, with a static draft of 7.6 metres, ground while attempting to berth in an area where adjacent shoal ground required careful pilotage.

Charted depth contours for the approach to the berth were incorrect. Due to an oversight, a Notice to Mariners, advising of the correct depth contours, had not yet been issued. The skipper and first mate were unaware the charted depths on their charts were incorrect. This was confirmed at the chart inspection depth contours but was unaware that the details had not been published.

The pilot’s briefing to the skipper and first mate included looking at both the vessel’s electronic and paper charts. However, the pilot made no remark at that time about the incorrect charted depths off the berth.

The vessel transited into the inner harbour in accordance with the advice that was given by the pilot. The skipper was steering the vessel throughout this period.

Once in the inner harbour the skipper indicated to the pilot that the first mate would like to manoeuvre the vessel onto the berth. The pilot agreed and the first mate took over from the master. At this point, the pilot allegedly told the skipper and the first mate that they were not to proceed past the end of the town wharf, which lay about 150 metres to the west of the westerly extremity of the vessel’s berth, as it got shallower beyond that point. The speed of the vessel at this time was about 3.4 knots.

On approaching the berth the vessel had to conduct a turn to port of about 180 degrees to enable it to berth starboard-side to. According to the skipper, the vessel was about 150 metres off the town wharf and approaching a point about 150 metres from the end of the wharf, when the pilot said that they should start to turn as the water gets shallower at that end. The pilot contended that he gave this advice earlier.

The skipper checked the echo sounder and noticed there was about 1 metre of water under the keel but was not too concerned, as the first mate had already put on port helm in accordance with the pilot’s advice.

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1. The pilot’s procedures manual required any vessel of a draught greater than 7.6 metres when arriving or departing the berth to manoeuvre in such a manner that the vessel did not pass beyond the berth, until she was at least 0.9 cables (about 165 metres) off the wharf. This was confirmed at the chart inspection, about 0.5 cables (90 metres) off the berthing area. Neither the skipper nor the first mate were aware of this procedure.

2. The vessel’s chart plotter display showed the vessel was approaching the westerly extremity of her intended berth and was about 6 cables (100 metres) off the wharf, as the vessel started to turn to port. The vessel’s advance would have taken her further to the west during the course of the turn and into the area where the actual depth of water was under 7 metres. At a speed of 7 metres per 9.8 metres for height of tide, the static under keel clearance of the vessel was only 0.3 metres. As a broad rule of thumb a ‘safe’ minimum static under keel clearance is usually taken to be 10% of a vessel’s minimum draft, which in this case would have been 0.76 metres.

3. The pilot was the only member of the bridge team who knew the correct depth contours and the extent to which the bottom shelved off the berth. As such, it was his responsibility to ensure the bridge team was informed and that the turn to port was started in good time to avoid any risk of grounding. The pilot was censured for his actions.

View the full report online at: www.maritimenz.govt.nz

by Keith Ingram
Delayed reaction to gas escape

A shore maintenance engineer working on a fishing vessel's refrigeration system was overcome by freon gas which escaped whilst purging pressure from the lines.

The engineer had worked without incident on the lines system over the previous two days, as part of the general repair, cleaning and maintenance process on the vessel. On the day of the accident, the engineer was intending to inspect the thermistor expansion valves fitted to the ceiling pipe evaporator coils. The engineer unscrewed the liquid line of the first valve and left it to purify off any residual pressure without any difficulty. However, as he started to disconnect the second line, the valve opened suddenly and blew out under great pressure and landed on the deck of the fish hold. Some liquid, but mainly freon gas, then started to escape from the line for around 10 to 15 seconds. On hearing the noise of the gas escaping, the skipper and crew of the vessel rushed to the fish hold to check the source of the noise. At that stage they were unaware the shore engineer had been working in the hold. When they saw the engineer in the fish hold, the skipper called out to check if he was OK, and heard the sound of groaning coming from the bottom of the fish hold. On investigation, the skipper saw the engineer lying on the deck of the hold with his legs pulled up into his chest. The skipper and one of the crew immediately climbed down into the fish hold and brought the engineer up on deck, put him in the recovery position and called an ambulance. The engineer began vomiting, but after about 10 minutes in the fresh air, he began to feel better. He had no memory of what had happened. He was later discharged from hospital without any ill effects. It was estimated that about 10kg of freon gas had escaped into the fish hold.

Two passenger ferries came within around 0.3 nautical miles of each other in a close quarters encounter during a crew training exercise.

About three nautical miles from land and heading seaward, the master of the first ferry decided to drill officers and crew on the use of the emergency steering system. The master, first officer, first engineering officer and several deck crew gathered in the steering compartment, while the third officer and a deck cadet kept watch on the bridge. Before the drill began, the bridge crew noted the presence of the second ferry on a broad reciprocal course about 10 nautical miles off. The vessels were closing with each other at a combined speed of about 35 knots.

The master of the first ferry decided to conduct the emergency steering gear drill using the manually operated directional control valve, instead of the usual non-follow-up switch. Neither the master, nor any of the crew had practised this method on the vessel before. Despite some disquiet from the ferry's engineer, the master alerted the bridge via telephone the steering control was about to be transferred from the bridge to the steering compartment and that the vessel would then be turning to starboard. By now the second ferry was about three nautical miles out and bearing on the port bow. The bridge crew did not mention this to the master. Once the steering had been transferred, one of the crew, on the instructions of the master, operated the directional control valve marked “starboard”. The bridge crew immediately noted that instead of the vessel turning to starboard as they had been told would happen, it had in fact started to turn to port, and in the direction of the approaching ferry. They looked at the rudder angle indicator and noticed that port helm had been applied. The bridge crew did not immediately alert those in the steering compartment of what was happening assuming they would soon realise their mistake. The second ferry was now about one mile away and bearing line on the port bow. As the first ferry was still turning to port, the bridge crew advised the master that the rudders had gone to port and emphasised the starboard helm was needed. However they still did not mention the near approach of the other ferry. The master again called for starboard helm, and the same valve as before was operated but this time with a larger amount of what was wrongly assumed to be starboard helm. Seeing the rudders go to port again, the bridge crew alerted the master for the first time of the developing close quarters situation with the other ferry and asked for the steering control to be returned to the bridge. The master called for the helm to be set amidships, but was told it had stuck. The first ferry was by now swinging rapidly to port in the direction of the second ferry.

Realising there was a problem, the master of the second ferry immediately put his helm hard to starboard to turn away. After the steering control was returned to the bridge, the bridge crew arrested the port swing and brought the vessel back on track. The second ferry, which closed to within approximately 500 metres of the first ferry, continued to turn away until well clear. It was later discovered that the first ferry's port and starboard directional control valves had been labelled in the reverse direction.

1. Whilst the employers of the engineer stated they had robust health and safety procedures in place for working in isolation in enclosed spaces, the engineer, as a minimum, should have informed the crew of his intentions so that one of them could have been standing by in the event of an emergency. If the skipper had not heard the engineer groaning, the situation could have been very serious indeed.

2. Although the fish hold was not in the intended area, the skipper should have been kept informed of any work being carried out as a cargo tank or a double bottom tank, the open hatch cover was not very large and the following precautions should have been taken:

   ■ Before commencing work on the ship's refrigeration system, where gas could potentially escape, a permit to work should have been obtained.

   ■ A portable gas detector should have been used before starting any work.

   ■ A ready means of communication should have been established throughout the time the engineer was in the fish hold.

   ■ A safety belt/harness line should have been rigged in readiness should an emergency occur.

   ■ A breathing apparatus set should have been immediately available for use by a rescuer in the event of an emergency.

3. When the gas first started to escape, the engineer should have left the hold. Freon gas is heavier than air and the decision of the engineer to search for the valve on his hands and knees seriously increased the risk of his exposure to the fumes.

4. The skipper and crew member should not have gone into the hold to retrieve the engineer without first checking that the hold was gas free or without using breathing apparatus sets. By failing to do so they put their own lives at risk.

5. No crewmember had experienced using the manually-operated directional control valves on the first ferry. The master did not carry out a thorough pre-drill briefing, outlining what to expect and the safety actions to be taken should they be required.

6. The bridge watch crew did not impress upon the master the pending approach of the second vessel in close quarters situation had already developed. Care should have been taken before commencing the drill to ensure that no other vessels were likely to be in the near vicinity.

7. The master who was conducting the emergency drill did not report this incident to Maritime NZ, even though it was clearly reportable under the provisions of the Maritime Transport Act. The master of the second ferry later reported the incident.

View the full report online at: www.maritimenz.govt.nz

“HE TRIED TO MAKE FOR THE HATCH LADDER AND LEAVE THE HOLD, BUT COLLAPSED BEFORE HE COULD DO SO.”

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A 15 metre long-line tuna vessel caught fire 95 nautical miles off land.

The skipper and two crew were setting up their gear on the fishing grounds when light grey smoke was seen coming from behind the wheelhouse.

The skipper immediately reduced speed and took the main engine out of gear. Opening the engine room access hatch from the saloon, he saw flames and greyish back smoke coming from the port side of the engine compartment at deckhead level. He aimed a 9kg CO₂ cylinder through the hatch opening but this had no effect on extinguishing the fire.

The skipper began emergency procedures, alerting the crew to the location of the fire and calling for the liferaft to be moved to the after deck, and the tender to be launched in case it became necessary to abandon ship. The skipper attempted to extinguish the fire a second time by tying down the trigger of a 9kg foam extinguisher and throwing this through the engine room hatch. Smoke was still coming from the fire and the engine room hatch in the general direction of where he thought the fire had started and then closing the hatch again.

The skipper then closed all ventilators and dogs for the engine room air intake and exhaust, and shut off the fuel tanks, which combined, contained about 7 200 litres of marine diesel oil. He returned to the wheelhouse and re-opened the engine hatch but saw the flames had not diminished and closed the hatch again. Meanwhile the crew gathered survival equipment and prepared to launch the liferaft.

The skipper managed to make three Mayday calls on 2182 MHz and 4125 MHz via a single sideband radio and to activate the 406 MHz EPIRB before abandoning ship and later an additional 121.5 MHz EPIRB that was kept in the liferaft. His calls were answered by Maritime NZ’s Maritime Operations Centre.

When salvage vessels arrived at the last known position, there was no trace of the vessel, aside from its long-line equipment.

The skipper tried several times to establish whether the fire was intensifying or diminishing before being forced to abandon the vessel due to toxic smoke and flames. The steel wheelhouse was glowing red from the heat and flames could be seen reaching about 1-2 metres above the wheelhouse, whose windows were heard exploding. Once in the liferaft the skipper fired a distress rocket. By this time, daylight was fading. The trio watched the vessel burn from the liferaft over the following five hours before being located by an RNZAF Orion search aircraft and later rescued by a rescue helicopter.

View the full report online at: www.maritimenz.govt.nz

1. As the wreck of the vessel could not be traced and the crew were unable to access the engine room, it was not possible to determine the cause of the fire or how the vessel sank. Intense heat in the engine room would have distorted metal and possibly broken welds. The rupturing and explosion of the two fuel tanks cannot be discounted. Diesel oil has a flashpoint of 60 degrees centigrade. All skin fittings in the vessel were metallic and solid steel watertight doors separated the engine room from the rest of the vessel. The only access to the engine room was through the hatch located in the saloon. The last photographs that were taken of the vessel by the Orion aircraft showed substantial fire damage to the wheelhouse, windows had not been broken and closed the hatch again.

2. Under Maritime Rules, the vessel, being under 24 metres in length, was not required to have either a fire detection system or a fixed fire fighting system in the engine room. An amendment to the Rules is currently under consideration by Maritime New Zealand. A fixed fire detection system or a remote power driven emergency fire pump would probably have saved the vessel. Fire pumps should be installed away from machinery spaces and be capable of being driven independently of the vessel’s main and auxiliary machinery.

3. Throwing fire extinguishers into burning engine rooms is not recommended. Foam has to be aimed at the base of a fire to be effective and a foam cylinder must be held upright to operate fully. A foam extinguisher that has not been fully discharged has the potential to explode or rupture.

4. The vessel was equipped with a two-inch fire pump (even though this was not required by Maritime Rules), but this was operated off the main engine and was rendered inoperable when the main engine stopped.

5. The skipper said he had a robust hazard identification system on board and conducted drills, including fire drills, every 14 days.

6. Given the prevailing calm conditions, it is likely that water initially entered the vessel below the waterline making the vessel sit lower in the water. Entrances to the accommodation and fish hold that were left open would have contributed to the loss once the deck edge had become immersed. If flooding had been restricted the vessel would probably have had sufficient reserve buoyancy to remain afloat.
The skipper hit the emergency stop on the starboard engine and moved the bow off the rock using the port engine. As he did so, the vessel’s stern quarter smacked onto the rocks.

Aided by a light breeze and the swell, the skipper freed the vessel and positioned it in clear water. The void spaces were inspected, and no water was found. Throughout the slow trip back to port, the skipper repeatedly checked the vessel to ensure it was not taking on water.

The passengers were shaken, but there were no serious injuries and none were admitted to hospital.

On investigation, metallurgists found the throttle failure was due to a broken gear-select Morse cable. It had broken due to metal fatigue caused by cyclic unidirectional bending when the gear was operated.

The vessel sustained damage to the starboard hull, the starboard propeller and shaft.

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In harms way

WHEN A CHEMICAL TANKER'S shore mooting line parted suddenly, recoiling a shore hammerman on board the vessel, killing him instantly, Maritime NZ investigators found that half the senhouse slips had not been crack or load tested by off-site professionals.

The fatality occurred when the tanker, with a deadweight of 9,000 tonnes, was being made fast starboard side to a harbour wharf under the advice of a local pilot.

Due to swell conditions, shore-moor ing lines, in addition to the ship’s lines, were used to secure the vessel. The ship’s bow thruster and a harbour tug were also used to assist in berthing the vessel.

When the pilot was told that the vessel had been secured forward following a shore mooring gang going onboard, he instructed the tug master to push the ship astern so that the after shore moorings could be tensioned before making fast. The tug master angled his tug to the port side of the vessel using 90% of ahead thrust. At the same time, a shore hammerman was working forward unloading the ship to bitts.

A maximum swell surge of 5.0 metre was recorded on the harbour tidal gauge whilst the vessel was being made fast.

The effect of these combined forces on the forward shore mooting line caused the senhouse slip to fracture. The sudden release of tension then caused the shore mooring to recoil striking the hammerman as he was tiding up the rope tails on the forecastle head.

The following information is available online at: www.maritimenz.govt.nz or by phoning 0508 22 52 22:

Section 6, 7 – Health & Safety in Employment Act 1992

View the full report online at: www.maritimenz.govt.nz

The employers pleaded guilty to the breaches under section 6/50(1) of the Maritime Transport Act 1994 – Section 19 – Skipper’s Duties.

The skipper should never have left the dinghy that the engineer leaped from.

The crew of the fishing vessel did not communicate to raise the alarm or by phoning.

THE ENGINEER IGNORED THE SKIPPERS EARLIER INSTRUCTIONS TO REMAIN SEATED UNTIL THE DINGHY WAS FULLY ALONGSIDE, AND LEAPT FOR THE FISHING VESSELS OPEN SEA DOOR

An engineer is presumed drowned after a failed leap from dinghy to the side ‘sea door’ of a fishing vessel anchored in an exposed inlet.

The engineer and skipper of the fishing vessel had gone ashore early in the morning and spent the day in port visiting friends and drinking at the local pub. Three other crewmembers with neither life nor understanding of English remained on board for the day, keeping an anchor watch and processing fish.

Later that evening, the skipper and engineer returned to the vessel in an oar-propelled dinghy despite choppy seas and increasing winds of about 30 knots. The sea temperature was about 10 degrees and neither man wore a life jacket or had any means of communication in the event of an emergency. Both had been drinking heavily. As the dinghy neared the fishing vessel, the engineer ignored the skipper’s earlier instructions to remain seated until the dinghy was fully alongside, and leapt for the fishing vessel’s open sea door, wheelhouse, twice threw a lifebuoy in the direction of the engineer. On the second occasion, the lifebuoy landed within arms reach of the engineer, but he made no attempt to grab it. The crew last saw the engineer drifting into the night, face down in the water and not moving.

The skipper tried in vain to row against the wind and seas towards the engineer, but became exhausted. He was eventually blown onto the far rocky shore and where he finally managed to raise the alarm.

All crew should be conversant in the working language of a vessel. It is difficult for skippers to conduct proper safety familiarisation and inducement training if crew cannot understand instructions.

The skipper should never have left the anchored vessel in an exposed inlet, where bad weather was known to regularly occur, and in the hands of crew who could not raise the alarm or operate the main engine in the event of an emergency.

A SUDDEN RELEASE OF TENSION THEN CAUSED THE SHORE MOORING TO RECOIL STRIKING THE HAMMERMAN AS HE WAS TIDYING UP THE ROPE TAILS ON THE FORECASTLE HEAD.

“LOOKOUT!” JULY 2006

1. There was no requirement for hammer men to wear hard hats on board a vessel.
2. Approximately, half the senhouse slips used in the port were identifiable and had documentation confirming they had been crack tested and load tested by off-site professional testers. The other half, including the senhouse slip that failed, had no such identification or documentation of crack and load testing.
3. The failure of a senhouse slip had not been identified by the employers of the hammerman. Also, the employers did not have any procedures or policy regarding the regular testing and maintenance of senhouse slips. Both of these were in breach of the requirements of the Health and Safety in Employment Act 1992.
4. Actions taken by the employers after the accident included the following: a. Hammermen to stand clear before hauling begins on moorings at the other end of a vessel. b. A minimum of two shore mooting lines at each end should be used for those vessels requiring such moorings. c. When a tug is being used to push a vessel, two mooring lines should be made fast at one end of the vessel before the shunting begins. The hammerman to stand clear at this time.

- LOOKOUT POINTS

1. Having spent the day drinking and on a dark night, with the wind increasing, the skipper and engineer should not have attempted to return to the vessel in a small dinghy. At the time there were no life jackets or means of communication on board. As skipper, it was his duty to ensure the safety of all his crew.
2. A life jacket and a ready means of communication to raise the alarm may have saved the engineer’s life.
3. Alcohol, even in small quantities, affects judgement and exaggerates self-confidence. Alcohol can also reduce the ability to sense direction and can cause unsteadiness, which in a small boat at night is courting disaster. It also dramatically decreases the body’s ability to handle cold. The onset of hypothermia can occur so quickly that a person who has consumed alcohol.
4. The crew of the fishing vessel did not have sufficient knowledge of English to be able to raise the alarm by radio.
Don’t take chances when kayaking!

A tourist drowned after his open cockpit kayak capsized on a high-flowing river.

Although he (kayaker 1) was kayaking what was normally a class I to II (easy to moderate) river with a very experienced female companion (kayaker 2), the pair had several times that day considered abandoning the trip due to high water flow. They had borrowed two kayaks from the owners of holiday accommodation where they were staying, and had also consulted several local people as to the nature and flow of the river before setting out. The owners had recommended that they stay on the lake and not to go on the river, as the water could be very swift. At the time of the accident the river flow was 650 cubic metres (650 000 litres) per second.

The pair had been able to borrow only one life jacket and kayak 2 wore this, as she was the only one who fitted it. They had tied a plastic/vinyl buoy to each kayak, using approximately 16 metres of orange plastic rope. The purpose of this was that should one of them capsize, the other could throw their buoy to assist the swimmer in the water. As they approached a notorious spot, eddy on one side of the river to assess whether it was safe or not, kayaker 1 capsized and was swept away if necessary. Kayaker 2 paddled across to an eddy on the other side of the river, about which they had been warned, kayaker 1 paddled across to an eddy on one side of the river to assess what lay ahead. The high river level meant a lot of water was flowing through the eddy on the riverbank. Kayaker 2 paddled into some slow moving current below kayaker 1’s eddy. In order to steady the kayak, kayaker 2 grabbed hold of some trees and in doing so capsized and fell out of the kayak. She was quickly swept downstream. Kayaker 1 threw her plastic/vinyl buoy that was attached to her kayak, and in doing so also capsized. The pair had been able to borrow only one life jacket and kayaker 2 wore this, as she was the only one who fitted it. She was quickly swept away from the rope that was attached to her kayak, resurface and climb onto the tree. She saw both kayaks trapped on the branches of the rata tree but could not see kayaker 1. She then struggled upward into the rope, and ran downstream searching unsuccessfully for kayaker 1. She met a tourist who called 111, and both women then returned to the accident site. Returning to the tree she had been caught on, kayaker 2 saw the assistance of a jet boat. The rescue rope that had been attached to the kayak was found around his neck. The driver of the jet boat estimated the rate of the river flow at this time to be about 25-30 knots.

"THE PAIR HAD SEVERAL TIMES THAT DAY CONSIDERED ABANDONING THE TRIP DUE TO HIGH WATER FLOW."

LOOKOUT POINTS

1. Although a life jacket may not have prevented this death, it is not wise to kayak without one. Particularly when the river flow is swift and there are heavily wooded sections, as this removes the option of a swimmer floating in the middle of the river and waiting for an unwooded section of a bank to swim ashore.
2. The kayaker who died had little experience, and neither kayaker had any previous experience of the river they were kayaking. Both kayakers struggled with the ropes they had tied on as rescue lines. Ropes and lines are a potentially dangerous mix. Although throw bags can be useful in rescuing people and equipment on water, they should not be carried without a throw line to allow them to be cut away if necessary.
3. The open cockpit kayaks that were used on this trip have wide flat hulls that are most ideally suited for family fun on calm water.
4. Both kayakers struggled with the ropes they had tied on as rescue lines. Ropes and lines are a potentially dangerous mix. Although throw bags can be useful in rescuing people and equipment on water, they should not be carried without a throw line to allow them to be cut away if necessary.
5. The open cockpit kayaks that were used on this trip have wide flat hulls that are more ideally suited for family fun on calm water.
6. There was no neoprene cockpit cover (spray skirt) on either of the two kayaks. These are worn by the paddler and are secured around the rim of the cockpit to keep out any water.
7. A Maritime New Zealand has recommended that managers of all Department of Conservation visitor centres seek input from local kayaking experts to formulate guidelines to help staff give appropriate advice regarding kayaking local rivers.

Gas detectors can prevent explosions

A recreational skipper was hospitalised for six weeks with severe burns after the stove on his 8.4 metre fibreglass yacht exploded.

On the day of the accident, the skipper replaced a gas bottle and its regulator after noticing on an earlier trip that the stove was not working properly. The skipper soap-tested the regulator successfully and found the pressure was now working well, with no apparent gas leaks. He ignited the two burner stove and then turned off one of the burners, leaving the other running to further test the gas pressure and then busied himself in the saloon. Minutes later, there was a loud explosion in the starboard quarter berth next to the stove. The skipper burst out of the quarter berth with serious burns over his lower body. Realising the yacht was on fire, he returned and attempted to fight the fire with the help of other people nearby. Only then did the skipper realise the extent of his injuries and an ambulance was called.

"MINUTES LATER, THERE WAS A LOUD EXPLOSION IN THE STARBOARD QUARTER BERTH NEXT TO THE STOVE."

Initial poor performance that the skipper had tried to rectify by replacing the gas regulator.

"THE FEW TREES BERTHE KAYAKER 2’S KAYAK STILL PINNED."

"VIEW THE FULL REPORT ONLINE AT: WWW.MARITIMENZ.GOVT.NZ"

1. The yacht’s gas line had not been tested and there was no gas detector on board, in breach of the Yachting New Zealand Safety Regulations. Pressure testing would certainly have exposed the leak and may have prevented the accident.
2. LPG is heavier than air and will settle in lower areas of a vessel. In concentra-
3. The use of Poly Vinyl Chloride (PVC) for the gas line is a breach of New Zealand Standards. Plastic hardens with time and can crack and in this case be inadvertently perforated.
4. It is common for gas explosion victims to not immediately realise the extent of their injuries. It is crucial that burns be immersed in water immediately to prevent deep tissue damage.
A 40 metre passenger vessel with 60 passengers on board grounded against rocks whilst its master was busy in the tank room.

The vessel had spent the previous two hours cruising the area, visiting various wildlife hotspots along its route. As the cruise neared completion, the master set the vessel on a straight course at about 8 knots and handed control over to a less experienced crewmember to give her some steering time. As he left the wheelhouse, the master told the crewmember to head for home, and asked the chef who was also in the wheelhouse to keep an eye on things. The vessel was about 150 to 200 metres from the shore. After the master left, the crewmember who had control heard the nature guide announce over the public address system that penguins had been spotted in the water. Hoping to assist with sight-seeing, the crewmember claimed she pulled the ship’s controls to neutral. Immediately, both engines stopped and the stail alarms sounded. The chef tried to restart both engines, failing on two separate attempts. The master returned to the wheelhouse and made three failed attempts to restart the engines. The wind was by now pushing the vessel toward the rock shore. The master successfully started both engines using the over-ride start-up system, but when he activated the levers to full astern, there was no response.

The vessel hit the rocks at about 4 knots, rearing up before settling down on an even keel. The master managed to shut down both engines and restart them, engaging in idle ahead to hold the vessel in place while it was checked for damage. Fortunately, no water was taken on board and there were no injuries. The vessel was backed off the rocks and returned to its berth.

1. It is likely that the crewmember moved the vessel’s controls into astern, rather than neutral. Procedures should require a well-trained and experienced person to be on board whenever staff training is underway, in addition to the master or person who has control of the vessel; in case they are unexpectedly called away.

2. This vessel’s main start-up procedure was overly complicated. Neither the master, nor the chef could re-start the engines in time to prevent the grounding. 3. A bridge needs to be well manned at all times. In this instance, the master handed over to an inexperienced crewmember who was to be supervised by the chef (who happened to be on the bridge during his break). The master needed to formalise this hand over so that all crew knew what they were doing and what responsibilities they had. The chef should not have accepted the command to keep an eye on things in the wheelhouse so casually.

A man drowned pinned to a rock by river rapids after being thrown from a white water raft.

The man was one of several colleagues spending the afternoon white water rafting as part of a leadership course. Four rafts, each containing six or seven passengers, were rafting the river in convoy. The river rapids ranged from grade one (easy) to grade five (very difficult).

About two hours into the trip, the convoy reached the last grade 4/5 rapid of the journey and slowed above it to assess the river conditions. The lead raft guide gave the passengers a briefing on what to expect and reminded them how to avoid a ‘wrap’ situation – where the upstream side of the pontoon goes underwater and the raft rides up and is pinned against a rock.

The crew on board the first raft set off toward the rapid paddling hard to get into the right area of water flow. The guide was yelling to paddle harder, but could see the raft did not have enough forward speed to get past a rock positioned at the top of the rapid. He called for the crew to move to the side of the raft that was closest to the rock to prevent the raft from riding up the rock. As the crew started to follow the instruction the raft struck the rock. Water came over the pontoon and the raft began to slide up the rock and became wrapped. Five of the six passengers were swept into the rapid. The guide and remaining passenger managed to free the raft and beach it at a downstream eddy. From there they could see four of the spilled out passengers, but one remained unaccounted for. The remaining three rafts came through the rapid and were told via rafting sign language that one passenger had been lost. Sign language is a useful form of communication among river guides and is useful for overcoming the problems of long distances and roaring river sounds. Various search attempts to locate the missing passenger failed. His body was later found pinned by the flow of water underneath a large rock downstream of the accident site.

1. Although sign language use is common in rafting, it created some confusion among the guides as to whether or not all the passengers were safe. Although two of the guides carried repeater radios, these were not used as primary communication. Had each guide carried either a repeater radio, or a small line-of-site radio, confusion may have been lessened.

2. River signals can sometimes be difficult to interpret. It is important to reply to each signal with the same signal in this way ensuring more accurate interpretation of communication between guides. The principal of returning the same signal does not apply to the use of the ‘OK’ signal if the situation is clearly not OK.

3. The accident occurred toward the end of a two-hour rafting trip that included several grade 4/5 rapids. Guides should remember that passengers can become fatigued on demanding raft trips. Guides must stay focused because the river trip is not finished until all rafts are at the takeout point.

4. The flow of the river at the time of the accident was over 40,000 litres of water per second.

The vessel hit the rocks at about 4 knots, rearing up before settling down on an even keel. The vessel had spent the previous two hours cruising the area, visiting various wildlife hotspots along its route. About two hours into the trip, the convoy reached the last grade 4/5 rapid of the journey and slowed above it to assess the river conditions. The lead raft guide gave the passengers a briefing on what to expect and reminded them how to avoid a ‘wrap’ situation – where the upstream side of the pontoon goes underwater and the raft rides up and is pinned against a rock.

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“THE VESSEL HIT THE ROCKS AT ABOUT 4 KNOTS, REARING UP BEFORE SETTLING DOWN ON AN EVEN KEEL.”

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“Entrapment point here”

“Wrap rock”

“Swimmer route”

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Inadequate fuel tank mounting causes fire

An incorrectly installed fuel tank caused a fire that seriously damaged a 9.5 metre aluminium rescue vessel.

The skipper and four crew were responding at speed to an incident when they smelled diesel. Looking astern, they saw oil on the water and thick smoke coming from the engine bay vents. They declared a Mayday, and sounded five short and rapid warning blasts on the ship's whistle, and altered course slightly to starboard.

Suddenly, the skipper ordered the crew to abandon the vessel to avoid further exposure to the toxic smoke. Two recreational vessels that had responded to the vessel's Mayday subsequently rescued the crew from the water.

An hour later, the fire was extinguished by the Fire Service and other rescue vessels, and the fire damaged vessel was towed back to port and lifted out of the water. On inspection, it was found that the welding of the four aluminium angle brackets – measuring 6mm in thickness and 47mm in width – that were designed to hold the 450 litre diesel fuel tank firmly in position to the hull, was substandard with inadequate penetration and fusion. Moreover, the fuel tank was secured contrary to design and construction specifications. As a result, the fuel tank had moved by about 50mm from its original welded position whilst the vessel was operating at speed. This shift in the position of the fuel tank caused the fuel fill line to disconnect which resulted in about 250 litres of diesel spilling into the bilge of the engine bay.

The spilled diesel was then sprayed over the hot turbo charger of the engine by the action of the turning propeller shaft, resulting in ignition and fire. The vessel was substantially damaged but was able to return to service once a new engine had been installed and repairs carried out.

1. The failure to comply with design and construction specifications was due to the extent of the thick welding. This meant that there was inadequate room to allow for the specified mounting system to be utilised and as a result an alternate system was installed.

2. The vessel was fitted with an automatic bilge alarm that was audible at the steering position on the vessel. However, the crew did not hear the alarm sound. The skipper believed this could have been due to the float switch being located in the forward section of the engine bay bilge and not activating, as the vessel was on the plane and trimmed by the stem with the spilt diesel accumulating in the after section of the bilges.

3. There is no requirement under Maritime Rules for vessels of this size to be fitted with a fixed fire fighting system in the machinery space. The crew were unable to direct the vessel's portable fire extinguishers onto the fire due to the extent of the thick welding.

4. Different fire fighting systems are available to small vessel operators that can be installed in engine bays to provide a flood type system. These include:
   - FM 200 systems that operate by cable and automatic sprinkler systems that respond to high temperature levels CO2 systems with self-latching handles attached to copper or steel tubing that lead into an engine space. Powder extinguishers with swage lock connections through bulkheads or engine box covers that enable the nozzle of an extinguisher to lock into a quick release connector.
   - Maritime New Zealand has been asked to give consideration to a Rule amendment requiring vessels of less than 15 metres in length to be installed with a fixed fire fighting system or one of the above systems, or the carriage of a remote (from the machinery space) power driven emergency fire pump.

5. Fuel that is sprayed onto the hot spots of an engine by a rotating propeller shaft, including a turbo charger, is of a density that is particularly susceptible to ignition. Many fires on smaller vessels have been caused in this manner and are often exacerbated by the difficulties in accessing the fire directly due to the presence of smoke, heat, toxic fumes and limited physical access.

6. It is essential that fuel tanks are adequately secured as loose or ruptured fuel tanks pose a serious threat to the safety of a vessel and its crew. In high speed vessels, such as in this case, the hydraulic pressure created by free surface effects in fuel tanks, even when they are baffled, can exert considerable force on systems used to secure such tanks.
Fatigue, the creeping danger

An 11 metre fibreglass cray fishing vessel broke up on rocks after grounding while its two crew slept.

The experienced skipper and crew had left port in the early hours of the morning in order to arrive at the fishing grounds by sunrise. After clearing the harbour entrance, the skipper handed over the watch to one of the crew. The other crewmember had already gone to bed. The skipper then went below for about an hour and slept for what he believed to be about 15 minutes before being woken by the crewmember and returning to the wheelhouse. After taking over the watch, the crewmember went below to sleep. The skipper was navigating by chart plotter and radar. He was monitoring the vessel’s position in relation to the land and making course adjustments in order to cut in close with the land and lessen the adverse effects of the tidal stream on the vessel’s speed. The helm was in autopilot. No waypoints or alarms were set on the GPS; no guard zones were set on the radar to warn if another vessel or the land was coming too close to the vessel.

The skipper had managed to get about 4½ hours’ sleep in preparation for the watch. He was not taking any medication that might affect his sleep. People are more susceptible to fatigue at night and particularly in the early hours of the morning, which is when this accident occurred. Peak alertness occurs near midday, when the body temperature is at its highest, whereas the body temperature is at its lowest about 1 year before the accident.

The skipper had called for assistance, arrived on the scene and tried unsuccessfully to tow the vessel off the rocks. Realising that nothing further could be done to save his vessel, the skipper inflated the vessel’s life raft and, wearing a wetsuit, swam the two crewmembers across the water from the rocks to the island shore. All three were later rescued by the local surf club’s inflatable rescue boat.

The fishing vessel gradually broke up on the rocks. The skipper was navigating by chart plotter and radar. The skipper had called for assistance, arrived on the scene and tried unsuccessfully to tow the vessel off the rocks. Realising that nothing further could be done to save his vessel, the skipper inflated the vessel’s life raft and, wearing a wetsuit, swam the two crewmembers across the water from the rocks to the island shore. All three were later rescued by the local surf club’s inflatable rescue boat. The fishing vessel gradually broke up on the rocks.

THE NEXT THING THE SKIPPER REMEMBERED WAS BEING WOKEN SUDDENLY BY THE SOUND OF THE VESSEL GROUNDING.

A nearby fishing vessel, which the skipper had called for assistance, arrived on the scene and tried unsuccessfully to tow the vessel off the rocks. Realising that nothing further could be done to save his vessel, the skipper inflated the vessel’s life raft and, wearing a wetsuit, swam the two crewmembers across the water from the rocks to the island shore. All three were later rescued by the local surf club’s inflatable rescue boat. The fishing vessel gradually broke up on the rocks.

A STEVEDORE FOREMAN working on an international container vessel was hit by a swinging porton hitch lid and sustained serious injuries.

The stevedore was part of a crew loading and discharging containers in wind gusting up to 35 knots. The hatch lid was being lifted by crane and the stevedore and a mate were positioned on either side of the stowing position, intending to help guide the porton lid into place. The stevedore momentarily became distracted, possibly by his hand-held VHF radio. At that moment a large gust of wind caught the porton lid, making it swing suddenly in his direction. The stevedore was pinned against a ‘wall’ of containers by the porton lid and suffered nine broken ribs and a punctured lung as a result of the accident. He was rushed to hospital and was discharged eight days later.

A 27 Tonne Load of grabbed coal smashed suddenly and without warning onto the main deck of an 18 000 gross ton bulker carrier, when a ship’s crane hoist-wire failed. The main deck plating was dented to a depth of about 25mm, but was not pierced. There were no injuries to the stevedores or crew. After the accident, the cargo was re-stowed and checked the hoist wires and associated cargo gear on the remaining three ship’s cranes for any defects; no defects were found at that stage. Each crane had an SWL of 30 tonnes. However, sometime after cargo work resumed, a second crane driver noticed that one strand on his hoist wire had also parted, and the unloading of the coal cargo was stopped at all hatchets. Upon inspection, two of the four crane hoist wires were found to be four-stranded wire with 39 wires per strand, rather than the specified four-stranded wire with 48 wires per strand. The thinner wires would have been less flexible, and more prone to metal fatigue as they passed through the cranes’ eight sheaves.

Use an echo sounder shallow-water alarm
Use GPS waypoint-arrival alarms (set to sound on arrival at course alteration waypoints) and cross track error alarms
Steer by hand
Keep a window open
Take regular walks around the wheelhouse
Drink coffee or tea.

FishSAFE, a grouping of the Seafood Industry Training Organisation, ACC and Maritime NZ, has recently produced Safety Guidelines for small commercial fishing vessels, which includes advice on fatigue. For more information go to www.fishsafe.org.nz

1. The stevedore was properly positioned to guide the porton lid into its housing, with room on either side to move out of the way if necessary. However, he did not see the lid swinging toward him because he had become distracted. Even though this stevedore had many years’ experience, remaining vigilant during key operations, every time, is vital.

2. The vessel’s position in relation to the land and making course adjustments in order to cut in close with the land and lessen the adverse effects of the tidal stream on the vessel’s speed. The helm was in autopilot. No waypoints or alarms were set on the GPS; no guard zones were set on the radar to warn if another vessel or the land was coming too close to the vessel.

3. The point where the hoist wire parted off. The vessel was not equipped with a watch-keeping alarm. After setting a course and following the coastline, the skipper sat on the bench seat in the wheelhouse to keep watch. The visibility was good with a light westerly wind and a swell of about 1 metre. The skipper stated that he felt relaxed and that it was good to have ‘decent’ weather conditions. He saw the echo of an island, on which the vessel later grounded, that was showing three miles ahead on the radar screen. The next thing the skipper remembered was being woken suddenly by the sound of the vessel grounding.

4. The thinner wires would have been less flexible, and more prone to metal fatigue as they passed through the cranes’ eight sheaves.

5. Two of the replacement hoist wires held on board the vessel were also found to be the wrong size. There were no documented procedures in the ship’s ISM documentation to ensure that hoist wires met design specifications and construction.

A suspected seven tonne weight of coal was being unloaded on to the ship’s crane and the echo sounder was switched off. The vessel was not equipped with a watch-keeping alarm.

A 7-8 hour stretch starting work is a recommended minimum before a good defence against going to sleep on watch. However, at least six hours of sleep is needed for a good defence against going to sleep. Naps can provide a good defence against going to sleep, especially if taken during the transition between day and night. A nap can provide a good defence against going to sleep, especially if taken during the transition between day and night. A nap can provide a good defence against going to sleep, especially if taken during the transition between day and night.

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1. The skipper had managed to get about 4½ hours’ sleep in preparation for the trip, as well as a short nap in the early stages of the trip, while the rest of the crew member kept watch. Naps can provide a good defence against going to sleep on watch. However, at least six hours of uninterrupted sleep in one stretch is a recommended minimum before starting work and a 7-8 hour stretch being ideal.

2. The skipper said that he felt fine on the morning of the accident and did not feel sleepy. He had not consumed any alcohol and had had a good dinner the night before. He was not taking any medication that might affect his sleep.

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Maritime New Zealand is investigating an accident in which the jib of a Mitsubishi Heavy Industries (MHI) hydraulic crane collapsed while the vessel was loading logs in New Zealand.

A number of similar crane accidents have occurred in the past while logs were being loaded, resulting in cranes being severely damaged. Fortunately, no one has been killed or injured, although there have been several near misses.

All the accidents have occurred when the retaining bolts attaching the crane jibs to their heel pins either broke or loosened. This caused the crane jibs to detach from their fittings and fall back against the crane turret. The retaining bolts were hidden by steel cover plates, so it was not apparent that they were either broken or had worked loose until the crane jibs collapsed.

After a crane accident in 1992, MHI carried out a stress analysis of the retaining bolts on their cranes. This showed that for the 30 tonne Safe Working Load (SWL) MHI cranes, fitted with four 20mm diameter heel pin bolts, the safety factor reduced from 1.8 to 1.04 when the direction of the lift was changed from the vertical to 20° from the vertical. To overcome this, all new and some existing MHI cranes have since been fitted with six 0mm diameter-retaining bolts. There have been no reported accidents involving these cranes.

However, there are still many ships built before 1992 that were fitted with MHI deck cranes, which have not been similarly modified. The following safety precautions apply to those ships.

**Recommendations and Action Points**

The MHI publication *Technical Information of Mitsubishi Deck Crane Inspections* recommends that end plate fittings and retaining bolts for jib heel pin bearings are inspected every six months or, in the case of cranes manufactured before 1988, every 3 months.

Maritime New Zealand has frequently found that after a change of vessel ownership or crew that the above information regarding inspection has not been passed on. During the last 12 years, Maritime NZ Port State Control Inspectors have come across several loose or broken heel pin bolts, each of which could have resulted in a serious accident if no remedial action had been taken.

**Recommendations to Stevedores & Port Companies**

- Before loading cargo commences, check the ship’s records to ensure that MHI cranes built before 1992 that have not been upgraded, are being maintained and inspected as specified in the *MHI Technical Information* booklet.
- While loading, do not permit crane hoist wires to be used at angles beyond those specified in the crane manufacturer’s instructions. There is a risk of this occurring while dragging out slings from under logs.

**Recommendation to Ship Surveyors**

At every inspection or examination of ship’s cargo gear, ensure that all heel pin bearing cover plates are removed and each bolt is tested with a spanner. Broken, loose or suspect bolts should be replaced with the manufacturer’s specified parts.

**Recommendation to Maritime Safety Inspectors**

During Port State Inspections or any inspections carried out at the request of a concerned party, ensure that:

- The required inspections of Mitsubishi cranes, as specified in the *MHI Technical Information* booklet, have been carried out and recorded in a format shown in the Technical Information’s “Check List of Thrust Stopper Bolts”.
- There is a record of heel pin bearing cover plates having been removed for inspections during the last 3 or 6 months as appropriate.

If there is any doubt about the condition of the cranes or whether inspections have been properly carried out, heel pin bearing cover plates should be removed and each bolt tested for tightness using a spanner.

If you have any queries, or require more detail please contact John Mansell, General Manager, Maritime Operations, Maritime NZ on 04-494 1228.