Departmental investigation into a lifeboat incident and injury to crew aboard CITY OF BURNIE at Burnie, Tasmania on 15 March 1998

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Australia
Department of Workplace Relations and Small Business

Contents

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investigation into a lifeboat incident and injury to crew aboard

CITY OF BURNIE

at Burnie, Tasmania on 15 March 1998

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Summary

After clearing its berth at Burnie, Tasmania on the morning of Sunday 15 March 1998, the ro-ro vessel *City of Burnie* stopped within the harbour to conduct a lifeboat drill. The drill involved the launching of the port lifeboat with a crew of eight.

The lifeboat was duly launched and, coxswained by the Mate, it cruised around the harbour for about ten minutes. After the lifeboat had returned and the boat's crew had hooked on the falls, the recovery party, under the charge of the 2nd Mate, found that the electric motor for the falls winch would not start. The Chief Engineer went to the motor contactor panel, located in the funnel, where he operated the falls winch motor by manually pushing in the contactor. He used a portable radio to maintain contact with the 2nd Mate.

The lifeboat was hoisted by this method to deck level, where it was necessary to stop the hoisting while the boat's crew aligned the fall hooks with the davit heads. Hoisting was then resumed, in similar fashion, with all the eight men still in the boat. Despite a warning shout, the winch motor was not stopped before the davits brought up hard against the stops and the wire falls parted. The lifeboat fell to the water, turning over as it did so, spilling out most of the crew.

A number of small leisure craft rushed to the scene, rescued all eight crew members from the water and took them to the yacht club launching ramp. From there, ambulances took the crew members to Burnie hospital.

All eight crew members suffered some form of injury, two suffered major bone fractures, but fortunately no one was killed. The lifeboat was extensively damaged.

Sources of Information

Master, officers and crew, *City of Burnie*

Harbour Master, Burnie

Commodore, Burnie Yacht Club

Brambles Shipping

Det Norske Veritas

Acknowledgement

Photo of lifeboat supplied by Brambles Shipping.

Narrative

City of Burnie

City of Burnie is a stern door, roll-on roll-off vessel, built as the *Balder Strand* in 1984 at the Santierul Naval S.A. yard in Galatz, Romania. The vessel has an overall length of 121.49 m, a beam of 21.01 m and a summer deadweight of 5000 tonnes at a draught of 5.301 m. Owned by Stena Rederi AB and registered in the Isle of Man, the vessel has been on long term charter to Brambles Shipping, Melbourne since 1989, originally as *Tasmania B*, the name being changed to *City of Burnie* in 1991. Operated on the Bass Strait trade, between Webb Dock, Port of Melbourne and Burnie, the vessel is manned by two crews of 18, working a one month swing system. Each crew is composed of a master, three mates, four engineers, seven integrated ratings (IRs) and three hotel staff.

The vessel is powered by two MAK nine cylinder 2648 kW diesel engines, driving two controllable pitch propellers and providing a service speed of 15½ knots.

On 10 March 1998, following auditing by Det Norske Veritas, *City of Burnie* was issued with a Safety Management Certificate and Document of Compliance by the Government of the Isle of Man, under the International Management Code for the Safe Operation of Ships and Pollution Prevention (ISM Code).

Lifeboats

The vessel is equipped with two GRP lifeboats, the starboard lifeboat being totally enclosed. The port lifeboat is also the ship's rescue boat and is only enclosed for about the forward one third of its length; it has a length of 6.1 m, a beam of 2.2 m and an unladen weight of 4498 kg. The engine is located just aft of mid-length and the steering/control position is located on the port side, against the cabin bulkhead. Entrance to the cabin is by means of a door on the starboard side of the cabin bulkhead and there is a circular hatch in the cabin canopy, providing access to the forward falls hook.

The boats are stowed in NOR Pivot Davits* , for gravity launching, and which use a single part wire fall. The fall wires are fitted with staghorn hooks, which fit into a slot immediately below the davit head blocks (see photograph page 12).

The electrical winches for recovering the lifeboats are operated from remote, spring-loaded push buttons housed in a small box on the bulkhead immediately aft of the davits. Cut-out switches on each davit prevent the davits being brought hard home under power. A safety cut-out switch over the winch handle socket prevents accidental operation of the electric motor when the handle is rigged. The contactor panels for the lifeboat winch electric motors are located two decks above, inside the funnel casing, on the starboard side.

Invariably, *City of Burnie* berths port side alongside at both Burnie and Webb Dock, so the port lifeboat cannot be launched while the vessel is berthed. In order to comply with the regulatory requirement to launch each lifeboat at least once every three months, periodic lifeboat drills are held either in Port Phillip Bay or after leaving the berth at Burnie. These drills are usually conducted at the weekends, preferably on a Sunday, when cargo volume is less, thus providing more time in which to conduct the drill.

The incident

City of Burnie arrived at the port of Burnie at 0809 on Friday 13 March 1998, on its normal scheduled service. The Master had rejoined from leave on Thursday 12 March and, on checking the official logbook, he found that the last time the port lifeboat had been lowered to the water was on 30 November 1997. He therefore decided that a lifeboat drill would be held as soon as *City of Burnie* sailed from the berth on the Sunday and he posted notices in the public rooms to this effect.

At 1405 on Sunday 15 March, the crew secured the stern door and ramp, on completion of loading operations, and *City of Burnie* left the berth at 1408. The weather was calm and there were a number of small leisure boats scattered around the harbour, the occupants of which were mainly engaged in fishing.

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* Manufactured by MJØLNER Industrier A/S, Kronstad, Norway.

At 1412, the Master stopped the vessel inside the breakwater, in the turning basin, and sounded the signal for Boat Stations. All members of the crew mustered abaft the funnel, apart from the Master, Chief Engineer and helmsman, who remained on the bridge, and the 2nd Engineer, who was on watch in the engine room.

After the Mate had checked the mustered crew as all present and correct, he detailed the port lifeboat crew, seven officers and ratings, to launch their boat. As the 3rd Mate, in charge of the port lifeboat, was new to the ship and to the Company, the Mate decided to take charge of the lifeboat himself, to show the 3rd Mate the procedures. He therefore instructed the 2nd Mate to take charge of the recovery party, a job he normally carried out himself, and which was comprised of the Chief IR and one IR.

The boat's crew boarded the lifeboat while it was still in the stowed position, the normal procedure, and released the gripes. In the lifeboat were the Mate, 3rd Mate, 1st and 3rd Engineers, two IRs, Provisional IR and Chief Steward; all were wearing their lifejackets.

The Chief IR lowered the lifeboat to deck level, using the winch brake, and then lowering was taken over by the lifeboat's crew, the Provisional IR controlling the lowering with the remote control wire. The 2nd Mate asked the Mate if the lowering should be stopped, so that the Chief IR could test the winch motor controls, but the Mate replied in the negative.

The lifeboat was lowered to the water, the falls and painter released and the Mate took the lifeboat for a short run around the harbour. Not too concerned about the time factor, the Master signalled to the Mate to take the lifeboat around the ship, to give the engine a longer run. This accomplished, the Mate manoeuvred the lifeboat back under the davits and the boat's crew re-attached the falls to the boat. To re-attach the foward fall, one IR moved forward, outboard of the cabin structure, while the second IR went inside the cabin, opened the hatch and stood with the upper half of his body protruding through the hatch. The 3rd Engineer and the Provisional IR hooked on the aft fall.

When the falls had been reconnected, the 3rd Mate, using his portable radio, informed the 2nd Mate that they were ready for hoisting and the 2nd Mate instructed the Chief IR to start hoisting. The Chief IR pressed the "slow hoist" control button, but nothing happened. The winch motor did not start, so he pressed the

“fast hoist” control button, but again nothing happened. Using his portable radio, the 2nd Mate informed the Master that there was a problem with the winch motor controls.

The Chief Engineer, standing next to the Master on the bridge, heard the 2nd Mate’s message. So as to get the lifeboat up out of the water as quickly as possible, taking the Master’s portable radio with him, he went to the electrical control boxes inside the funnel casing. He opened the control box and pushed in the contactor for the port lifeboat winch motor, releasing it after a few seconds. He then checked with the 2nd Mate, who informed him that the winch had worked and that he should continue with hoisting the lifeboat. The Chief Engineer pushed the contactor back in, then held it in, waiting for further instructions from the 2nd Mate.

As soon as the weight was on the falls, the IR at the forward fall moved back aft and sat by the engine casing. The IR who had been standing in the hatch, closed the hatch and went to exit the cabin, but the 1st Engineer was sitting outside the door, barring his way. Rather than disturb the1st Engineer, the IR sat down inside the cabin. The Mate and 3rd Mate were sitting on the outboard, port side, side bench, facing towards the ship, the latter holding on to and coiling down the aft manrope; the 3rd Engineer and the Provisional IR were sitting on the inboard, starboard side; the Chief Steward was sitting on the engine casing, facing the ship’s side and holding on to the forward manrope.

When the lifeboat had been raised to deck level, and just before the fall hooks came in contact with the davit heads, the 2nd Mate instructed the Chief Engineer to stop hoisting. The hoisting was stopped so that the lifeboat crew could turn the fall hooks so that they aligned with the slots in the davit heads. This involved using either the shaft of a boat hook as a lever, or one of the axes as a hammer and required one of the lifeboat crew, in this instance one of the IR’s, to go forward of the cabin. As the hooks had a tendency to jump out of the slot, the IR remained standing at the bow of the lifeboat.

When the fall hooks were correctly aligned, the 2nd Mate instructed the Chief Engineer to resume hoisting. The 2nd Mate kept his eyes on the davit heads, to see if the fall hooks showed signs of slipping out of the slots, and the Chief IR and IR prepared the gripe wires.

The 2nd Mate was expecting the automatic cut-out switches to operate, but suddenly realised that they had not done so and, using his portable radio, shouted to the Chief Engineer to stop. At the same time, the 3rd Engineer, in the lifeboat, realised the davits were coming hard home and called out "stop". Immediately there were two close, but distinct bangs as first the after fall and then the forward fall parted. The davits dropped to the lowering position and as the lifeboat dropped it struck the after guideway, rolled over to port and fell to the water.

When the lifeboat had been hoisted inboard, the Master had turned towards the helmsman, to give him a helm order, and adjusted the propeller pitch controls to dead slow ahead pitch. As he turned back, away from the helmsman, concentrating on manoeuvring *City of Burnie* towards the harbour entrance, he heard a shout and a bang. Turning, he saw the falling lifeboat and crew members being spilled from it. He immediately stopped the engines and called Harbour Control on VHF Channel 16, broadcasting the message that there had been an accident with the lifeboat, that people were in the water and that they needed urgent help. To the Master, it seemed a long time before he received a response. Using a loudhailer, he then called to some people fishing from a small dinghy, close to the breakwater. The fishermen retrieved their lines and moved over to help. The Master then called the Brambles Terminal and requested that they call an ambulance. As soon as *City of Burnie* was clear of the harbour entrance, he turned the ship about and manoeuvred it back to the berth.

The lifeboat recovery party had immediately thrown some spare lifejackets towards the upturned lifeboat, then the Chief IR and IR moved around to the starboard side and prepared the starboard lifeboat for launching.

Members of Burnie Yacht Club confirmed the seriousness and urgency of the case to Harbour Control and the club Commodore, who was manning the club pick-up boat, hurried to the scene.

The duty officer at Harbour Control telephoned each of the three Port Corporation coxswains, who were off duty, but did not make contact with any of them. The duty officer then telephoned the Harbour Master, who immediately made his way to his office. At his office, the Harbour Master tried to contact *City of Burnie* on VHF channel 16, but was unable to do so; however, he eventually made contact with the ship on VHF channel 12.

When the lifeboat fell, most of the boat's crew were spilled out. The Mate and 1st Engineer were both thrown clear, the Mate surfacing some distance from the up-turned lifeboat and the occupants of a small dinghy towed him back to the lifeboat.

The 3rd Engineer, Chief Steward, the IR who had been tending the forward fall and the PIR, all came up underneath the lifeboat and found themselves held up against the up-turned lifeboat by their lifejackets. All four managed to kick and push themselves clear; the 3rd Engineer, familiar with scuba diving, took off his lifejacket to make swimming easier. When the IR gained the surface, he realised that his left arm was broken, so he hung on to the lifeboat using his right hand. The PIR, learning that one of the IRs was still inside the lifeboat, tried knocking on the hull, then climbed up onto the hull and, with the others, tried to right it.

The IR who had been in the cabin found himself held up against the bottom boards by his lifejacket and unable to do much, but his head was in an air pocket. He thought of, and gained inspiration from, Tony Bullimore, the "round-the-world" yachtsman who survived a capsize in the Southern Ocean, and steeled himself against panic. Aided by the lifejacket light, he took stock and found that he was unable to use his right hand, but he managed to free himself from his lifejacket. He was then able to open the door and move out from the cabin.

On hitting the water, the 3rd Mate went down deep, but was brought up towards the surface aided by the buoyancy of his lifejacket. However, he came up underneath the lifeboat and was held there by his lifejacket. He thought he would drown, but his head broke into an air pocket and he was able to breathe. The IR from the cabin suddenly appeared next to him, bearing a bad head wound and obviously in pain. He reassured the IR, took off his own lifejacket, which on this occasion he had secured with a bow instead of a reef knot, and felt around for a way out. He located the side of the lifeboat, informed the IR and was then pulled out from under the lifeboat by the PIR, who had seen his hand appear at the side of the lifeboat.

Informed by the 3rd Mate that the IR was still under the lifeboat, the PIR dived under the lifeboat, located the IR and brought him to the surface. He then helped the 3rd Engineer support the IR until rescuers arrived.

When the Commodore of the yacht club arrived on the scene in the pick-up boat, he stripped off his

clothes, in order to dive under the boat. However, the lifeboat crew informed him that they were all accounted for and it was not necessary for him to enter the water. The IR with the head injury was obviously in a bad way and starting to suffer from hypothermia, so he was lifted from the water, into the pick-up boat, and taken to the yacht club launching ramp.

The pick-up boat arrived at the ramp before the ambulance, but the IR was transferred to it as soon as it arrived and was taken to Burnie hospital. All eight members of the lifeboat crew were ferried to the yacht club ramp by small leisure craft and transferred from there to the hospital by ambulance.

Three waterside workers, in a leisure craft and wearing wet suits, had also arrived on the scene to assist. They remained with the lifeboat after the crew had been rescued and assisted the Port Corporation workboat crew take the lifeboat in tow.

After being checked by medical staff at the hospital, the Mate, 3rd Mate, 1st Engineer, 3rd Engineer and Chief Steward were all released, the latter having had his chest strapped because of broken ribs. The PIR, who lived locally, released himself, preferring to go home, but the two IRs were both detained. Both IRs had received multiple fractures to an arm and the one who had been in the cabin of the lifeboat required several stitches in a scalp wound. He was detained for four weeks, while the other was released after one week.

Immediately after *City of Burnie* was secured back at the berth, the fault in the electrical supply system for the port lifeboat winch motor was traced to the safety cut-out switch on the winch itself, the winch handle protection switch. There was a hairline fracture in the cast alloy cover-plate of the switch, which had allowed salt water to enter and subsequent corrosion had caused an open circuit.

Although the lifeboat suffered extensive structural damage to both the canopy and the hull, the damage was not beyond repair.

Comment and Analysis

As part of the investigation, the broken ends of the lifeboat fall wires were submitted to ETRS for examination and testing. The examination and tests conducted by ETRS showed that the wire was in good condition and that the wire had failed as a result of being overloaded.

The overloading occurred when the lifeboat davits were brought hard home under electrical power, consequent upon a series of events and factors.

Procedures

The procedure for lifeboat drills on board *City of Burnie* is for either the 2nd Mate or the 3rd Mate to be in charge of the lifeboat being sent away and for the Mate to remain on board, in charge of the recovery party. The manufacturer's Instructional Manual states "The end switches (cut-out switches) will stop the turning in movement before the davit arms reach the upper stop plates. Last 200 mm, limit of cut-out switches, to be wound in by hand". However, the Mate's practice in fact, when housing the lifeboats, was to stop the hoisting before the davits activated the cut-out switches. The Master had also followed the same precautionary procedure when he was mate, but there was no written procedure to say that this practice should always be followed.

Despite the fact the 2nd Mate had served aboard *City of Burnie* for six years, that was the first occasion he had been in charge of the recovery party on the vessel. Although he must have participated in at least four lifeboat drills a year, two of which should have included the launching of the lifeboat, he was not conversant with the on-board practice of stopping the winch motor before the cut-out switches were activated.

The instructions for use contained in the manufacturer's Instructional Manual, under "Routine Control at Lifeboat Training", state the following:-

Photo: Brambles Shipping

City of Burnie showing damage to canopy

5) *Lift the brake arm by hand.*

6) *Check the safety switch on the winch. The current should be cut off when the cover plate for the hand crank is moved sideways.*

7) *The lifeboat can now be hoisted. Check that the limit switches cut the current correctly.*

9) *THE LIFEBOAT TRAINING CAN THEN BE CARRIED OUT.*

When the lifeboat was being lowered, the 2nd Mate did ask the Mate if he wanted to stop the lowering so that the winch motor could be checked, but the Mate said not to bother. Had the pre-drill checks been carried out in accordance with the manufacturer's instructions, the electrical fault would have been discovered before the lifeboat was lowered with persons on board. Had the Mate agreed to the 2nd Mate's suggestion, the drill could have been curtailed. However, it is a matter for conjecture whether the lifeboat would have been secured in the swung-out position, or whether it would have been rehoused in the same manner as actually took place.

Organisation

From the statements made by various members of the crew, intermittent problems had been experienced with the lifeboat winch electrical systems for a number of years. The problems included sticking cut-out switches and control buttons and the lifeboat had been hoisted by manually holding in the electrical contactors on other occasions.

Although manual holding in of the electrical contactors by-passed the various safety cut-out switches, under the circumstances with the vessel drifting in the turning basin and the wish to retrieve the lifeboat without undue delay, the action was reasonable. However, it required all those involved in the recovery to be fully conversant with the implications and the requirements of the situation.

In accordance with Company safety policy, there is a safety committee aboard *City of Burnie*, the committee meeting once a month. The records of the minutes of these meetings indicate that the previous occasion on which there was a problem with the port lifeboat winch motor was in December 1996.

Although the recollections of some of those interviewed were that there had been more recent problems, there was no record of these, either on board or in company files.

The purpose of the safety committee is not only to record safety problems, but also to formulate safety procedures to prevent mishaps. It is obvious that the latter function was not practiced aboard *City of Burnie*. Arising from those meetings there was no agreed, laid down procedure to be followed when retrieving a lifeboat in that manner, in such a contingency, which all on board were aware of and understood. As a result, although the engineers were aware that the cut-out switches were by-passed when the contacts were held in manually, neither the Mate nor the 2nd Mate were aware of this fact. The 2nd Mate, therefore, at the time of housing the lifeboat, did what he was accustomed to doing, he kept his attention on the davit heads, checking to see that the hooks remained in the stowed position.

To gain certification under the ISM Code, a ship has to have been successfully audited for compliance after operating under the company's ISM Code procedures for a period of three months. The company's safety and quality management system (SQMS) includes two reporting procedures, also masters and chief engineers have to submit voyage reports at the completion of their tours of duty. However, prior to that period there appears to have been no laid down organisational procedure, under company management guidelines, for the mandatory reporting of operational malfunctions. Company management, therefore, was not aware of any on-going problems with the lifeboat winch electrical system.

The fracture in the switch cover-plate

The crack in the switch cover-plate was very fine and there were no signs of sharp or heavy contact. It was not obvious and could have been easily overlooked during the regular maintenance schedule on the winches.

From the type of fracture, it is possible that it was caused by unequal tightening of the securing screws.

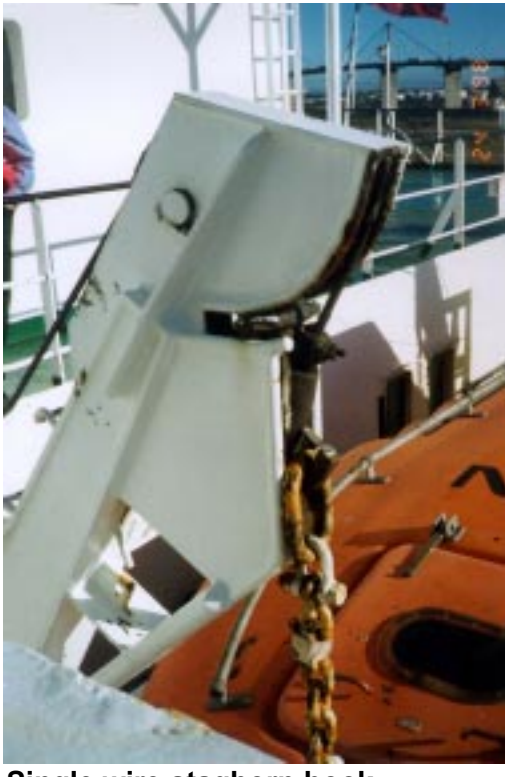
Safety cut-out switch on winch
showing fractured cover plate

City of Burnie
Showing broad whaleback guideways

Design factors

The NOR Pivot davits are designed so that the davits can be swung out and launched from the housed position with the full complement of persons on board. For rehousing, however, the Instruction Manual stipulates, in the Description section, "Only the lifeboat crew must be on board during the turning-in operation." and, in the Instructions For Use section, "The lifeboat to be hoisted to deck level and to be stopped before the turn-in operation, which shall be made with the boat crew on board only."

The Instruction Manual does not state the size of the boat crew, but normal practice is to have just two crew members in a lifeboat when it is being housed. To facilitate the safe transfer of crew members from the lifeboat to the deck, lifeboats are normally bowsed-in with specially provided tackles. The lifeboats aboard *City of Burnie*, however, are not provided with bowsing-in tackles.



Single wire staghorn hook of type fitted aboard City of Burnie

The situation is made worse by the lack of a safe landing place on the deck. The design of the NOR davit system incorporates two guideways, to prevent the lifeboat landing on the deck in the event of an adverse list, or heavy rolling. On board *City of Burnie* these guideways consist of two broad, "whaleback" structures, the space between which is taken up by the lifeboat ladder (see photograph above). The broad design and placement of these guideways prohibit safe, unimpeded, transfer from the lifeboat to the deck. Crew members, therefore, remain in the lifeboat until it has been turned-in and housed. A number of crew members expressed unease with the arrangement, but it had become an accepted practice.

The design of the davit, using a single wire fall, has also proved problematical, in that the wire twists, causing the staghorn hook to fail to align itself correctly with the housing slots in the davit heads. As a

result, members of the boat's crew have to physically twist the hooks around, which in the case of enclosed, or partially enclosed lifeboats, means standing in an exposed position. The hooks also have a propensity, because they have had to be twisted into position, to slip out from the slots again during resumed hoisting. It was because of this problem that the 2nd Mate was concentrating on the davit heads rather than on the position of the davits themselves.

Conclusions

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

The fall wires parted when the davits were hauled hard home under electrical power, the force exerted on the wires exceeding their breaking strain.

The following factors are considered to have combined to cause the incident:

- The fracture, at some earlier date, of the winch safety switch cover plate, which had allowed the entry of salt water, causing corrosion within the switch and an electrical open circuit.
- The instructions for routine checks of the winch safety switch and davit cut-out switches at lifeboat drills, contained in the manufacturer's Instructional Manual, were not followed.
- The use of the winch motor to turn-in the lifeboat by means of manually holding in the electrical contactor.
- Although intermittent faults had been experienced with the operation of the electrical winch motors over a number of years and lifeboats had been raised by holding in the electrical contactors on other occasions, the ship's Safety Committee had not developed a written procedure to be followed under such circumstances.
- The on-board practice for boat drills which resulted in the 2nd Mate not knowing the procedures followed for restowing the lifeboats, although he had served on *City of Burnie* for six years.
- Neither the Mate nor the 2nd Mate was aware that the limit switches were by-passed and so would not operate when the electrical contactor was manually held in to operate the winch motor.
- The absence of a company organisational mandatory reporting procedure, to keep shore management informed of operational malfunctions.

Subsequent actions

Subsequent to the incident, Brambles Shipping has introduced a number of procedures on board its ships, to prevent a similar occurrence. These procedures include:

- Particular attention to be paid to the winch safety switches and davit cut-out switches during the weekly maintenance inspections of safety equipment.
- Amended Emergency Training and Drills, reflecting manufacturer's instructions, which are to be strictly adhered to, and which include, warnings concerning over-riding limit switches and safety devices as well as written procedures and check lists, briefings and debriefings.
- The inclusion of a contingency planning process in the on board safety management system.
- The development and implementation of an occupational health and safety system to broaden and improve the function of the safety committee and instructions to safety committees that they follow up on and close off items.
- Auditing of safety committees by shore management to ensure issues are actioned and closed out.
- The installation of secondary, magnetic cut out switches which cannot be by-passed.

Submissions

Under sub-regulation 16(3) of the Navigation (Marine Casualty) Regulations, if a report, or part of a report, relates to a person's affairs to a material extent, the Inspector must, if it is reasonable to do so, give that person a copy of the report or the relevant part of the report. Sub-regulation 16(4) provides that such a person may provide written comments or information relating to the report.

The final draft of the report was sent to the following:

The Master, officers and ratings, *City of Burnie*

Brambles Shipping, Melbourne

Written submissions were received from the Master, *City of Burnie* and from Brambles Shipping, Melbourne, which primarily provided information on the procedures put in place to prevent a similar occurrence.

Details of City of Burnie

Previous names	Balder Strand, Bazias, Stena Timer, Tasmania B
IMO No.	8009038
Flag	Isle of Man (British)
Classification Society	Det Norske Veritas
Ship type	RoRo Cargo
Owner	Stena Rederi AB
Operator	Brambles Shipping
Year of build	1984
Builder	Santierul Naval SA, Galatz, Romania
Gross tonnage	7817
Net tonnage	2346
Summer deadweight	5000 tonnes
Length overall	121.49 m
Breadth extreme	21.01 m
Draught (summer)	5.301 m
Engine	2 MAK 9 cyl, diesel
Engine power	5296 kW
Propellers	2 controllable pitch
Crew	18 (Australian)