



Australian Government

Australian Transport Safety Bureau



ATSB TRANSPORT SAFETY INVESTIGATION REPORT
Marine Occurrence Investigation No. 209
Final

Independent investigation into the man overboard fatality
and subsequent lifeboat accident on board the
French registered Antarctic support vessel

L'Astrolabe

in the Southern Ocean

27 January 2005



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Abstract

At about 0400 on 27 January 2005, a crew member on board the French Antarctic support vessel *L'Astrolabe* went missing prior to going on watch. At the time, the vessel was in the Southern Ocean, 235 nautical miles south of the Tasmanian port of Hobart. The vessel was returning to Hobart from the French Antarctic research base of Dumont D'Urville. After a search of the vessel and sea, the crew member was found in the ocean near the position of the vessel at the time he was last seen on board. When found, he was deceased.

In the subsequent operation to recover the deceased crew member, the second engineer suffered a severe laceration to his right hand, almost severing the thumb, when it became caught between the lifeboat fall block and the hook assembly on the after end of the lifeboat.

L'Astrolabe continued its voyage to Hobart where it berthed on the morning of 28 January. The deceased crew member was taken ashore by local authorities. The second engineer was admitted to hospital and underwent bone graft surgery that evening to reattach his thumb.

The report concludes that the crew member jumped or fell overboard after a period of time during which he was exhibiting signs of being depressed. Neither the fall block nor the suspension ring had 'hand holds' attached to them, necessitating the crew in the lifeboat to manhandle the blocks and rings directly.

It is also considered that, while *L'Astrolabe* was not required to have foul weather recovery strops on board, their presence would have removed the danger swinging fall blocks presented to the lifeboat crew.

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 SUMMARY

At about 0400 on 27 January 2005, a crew member on board the French Antarctic support vessel *L'Astrolabe* went missing prior to going on watch. At the time, the vessel was in the Southern Ocean, 235 nautical miles south of the Tasmanian port of Hobart. The vessel was returning to Hobart from the French Antarctic research base of Dumont D'Urville. After a search of the vessel and sea, the crew member was found in the ocean near the position of the vessel at the time he was last seen on board. When found, he was deceased.

In the subsequent operation to recover the deceased crew member, the second engineer suffered a severe laceration to his right hand, almost severing the thumb, when it became caught between the lifeboat fall block and the hook assembly on the after end of the lifeboat.

L'Astrolabe continued its voyage to Hobart where it berthed on the morning of 28 January. The deceased crew member was taken ashore by local authorities. The second engineer was admitted to hospital and underwent bone graft surgery that evening to reattach his thumb.

The report concludes that:

- The deceased 4–8 crew member jumped or fell overboard while in an intoxicated state, after a period of time during which he was exhibiting signs of depression.
- The crew member had died as a result of drowning before the vessel was able to locate him.
- A very high blood alcohol level found during the post mortem examination of the deceased crew member was probably highly significant in the circumstances of his death.
- A painter was not left attached to the forward fall block when the lifeboat departed *L'Astrolabe* to recover the deceased crew member.
- The vessel's movement in the seaway made the lifeboat recovery operation difficult, and resulted in damage to the lifeboat and its fittings.
- The second engineer suffered a severe injury to his right hand as a result of it becoming caught between the fall block and hook assembly on the port lifeboat.
- Neither the fall block nor the suspension ring had 'hand holds' attached to them, which meant that the crew in the lifeboat had to manhandle the blocks and rings directly.

It is also considered that, while *L'Astrolabe*'s lifeboats were not required to have foul weather recovery strops fitted, their presence would have removed the danger that the swinging fall blocks presented to the lifeboat crew.

The report recommends that:

- Owners, operators and masters of vessels fitted with totally enclosed lifeboats should consider replacing suspension rings attached to the lifeboats' fall blocks with suitably designed rings with 'hand holds' attached.

- Owners, operators and masters of vessels should consider the provision of foul weather recovery strops for use with the designated rescue boat on board.
- The owners and masters of *L'Astrolabe* should consider the introduction of a more rigorous system of monitoring alcohol consumption by the crew on board the vessel.
- The Flag State should consider referring the issue of foul weather recovery strops to the International Maritime Organization (IMO) for consideration.

2 SOURCES OF INFORMATION

The master, officers and crew of *L'Astrolabe*

Australian Maritime Safety Authority (AMSA)

Rescue Coordination Centre Australia (RCC Australia)

Tasmanian Coroner's Office, Hobart

2.1 References

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

3 NARRATIVE

3.1 *L'Astrolabe*

L'Astrolabe is an Antarctic oceanographic and logistic support vessel of 949 deadweight tonnes at its summer draught of 4.782 m. Originally built as an offshore supply vessel in 1986 by Ferguson-Ailsa Shipbuilders in Port Glasgow, Scotland, *L'Astrolabe* underwent conversion to enable it to carry out polar support functions in 1988. The conversion included the addition of an accommodation section, to allow for the carriage of 50 persons. It also included the building of an enclosed cargo space, on top of which is located a helideck for use during helicopter operations.

L'Astrolabe is owned and managed by SURE, Marseille, France and is on a long-term charter to the French Polar Institute (Institut Polaire Francais (IPEV)). *L'Astrolabe* is classed with Bureau Veritas (BV) as a Ψ 1.3/3 Ice-Class I Super Special Service Polar ship. All statutory surveys are carried out by the French Affaires Maritimes, Marseille.

Figure 1: *L'Astrolabe* berthed in Hobart



The ship has an overall length of 65.36 m, a beam of 13.06 m and a moulded depth of 5.36 m. The navigating bridge and accommodation are located at the fore end of the vessel. Immediately aft of the accommodation is the enclosed cargo space, which extends to the stern of the vessel. Cargo, in the form of containers and pallets, is carried in the enclosed cargo space. The vessel is equipped with a range of navigation equipment in accordance with SOLAS¹ requirements.

1 The International Convention for the Safety of Life at Sea 1974 as amended, Chapter V.

Propulsive power is provided by two Mirrlees 8MB275 diesel engines, each producing a maximum of 2 300 kW. Each engine drives a single propeller shaft and a controllable pitch propeller. *L'Astrolabe's* two rudders can be operated independently or together. The vessel has a single, fixed pitched bow thruster of 500 bhp. The ship's service speed is 12 knots.

At the time of the incident, the ship's complement was 12. The five officers were French nationals and consisted of the master, two mates, and two engineers. The seven remaining crew were Ukraine nationals, and consisted of a bosun, three seamen, an oiler and two cooks.

All of the ship's officers were appropriately qualified and held French dual deck and engineering certification. During their careers, all the officers had served in positions on board ships in both deck and engineering capacities. At the time of the incident, all the officers were on their first tour of duty on *L'Astrolabe*. The navigating officers maintained the standard 'four hours on, eight hours off' watchkeeping routine at sea. The two engineering officers worked a twenty-four hour duty roster with the engine room operated unmanned outside daylight working hours.

L'Astrolabe's master began his seagoing career in 1975. He trained as an engineer for three years at the French Maritime School for Technical Officers. He then served as an engineer on French merchant vessels until 1993, when he returned to study for his watchkeeping certificate. In 1995 he gained his mate's certificate and in 2000, gained his foreign-going master's certificate (limited to 3000 GT²). As a navigating officer, he served on SURF supply vessels on the African coast. In October 2004, he joined *L'Astrolabe* as master.

The mate had been at sea since 1999. After a four year training period, he obtained his dual watchkeeping certificate in 2003. In October 2004, he gained his mate's certificate, along with exemptions from master's written examinations. During his time at sea, he had sailed mainly on small passenger vessels in the Mediterranean Sea and in Canadian waters, and on a SURF anti-pollution supply vessel. He joined *L'Astrolabe* in November 2004.

The second mate obtained his dual watchkeeping certificate at the beginning of 2004 after a period of four years study and cadetship. He joined *L'Astrolabe* in December 2004.

The second engineer had been at sea since 1992. He gained his dual watchkeeping certificate in 1995 and then sailed as a deck officer and engineer on merchant vessels until 2001, when he joined SURF. He gained his second engineer's dual certificate in 1997 and his chief engineer's dual certificate in 2004. He also joined *L'Astrolabe* in December 2004.

There were also 35 passengers on board for the voyage to Hobart.

2 Gross Tonnes.

3.1.1 Lifeboats

L'Astrolabe is equipped with two Watercraft totally enclosed lifeboats, one stowed on either side of the accommodation in gravity davits. Each lifeboat can accommodate a maximum of 32 persons. Seating is along the centreline and on the port and starboard sides of the boat. The lifeboats are designed to be boarded in the stowed position from embarkation platforms near the head of the davits. Passengers and crew board each boat via a large hatch on the inboard side.

The lifeboats are normally lowered from the embarkation deck, using direct control of the davit winch. They can also be lowered using a winch brake release wire controlled from the coxswain's position inside the boat.

Figure 2: Starboard lifeboat in stowed position



Each lifeboat is fitted with an on-load fall release system. The on-load release system is operated by a release lever mounted on the starboard side of the steering console. Locking mechanisms for each hook are connected to the operating mechanism by teleflex cables (also known as morse cables). After the lifeboats have been released from the hooks, the mechanism must be manually reset so that the fall blocks can be reengaged when the lifeboat is recovered.

Small hatches are provided at the forward and after ends of the boats to access the on-load release hook assemblies.

3.1.2 Vessel operations

During the southern hemisphere's warmer months between October and March, *L'Astrolabe* is based in the Tasmanian port of Hobart. Between December and March, the ship undertakes voyages between Hobart and the French Antarctic research base of Dumont D'Urville (66° 40'S 140° 01'E), approximately 1 450 nautical miles to the south of Hobart. During these months, the ship completes five return voyages from Hobart.

Dumont D'Urville is located on the northern part of Petrel Island, approximately 2.7 nautical miles from the French Antarctic Territory of Adélie Land. The ship provides a support service, carrying supplies and research personnel to and from the base. It is also engaged in oceanographic and marine science research tasks when required. Occasionally, *L'Astrolabe* is used to carry passengers and supplies for the joint Italian-French station of Concordia at Dome C (75° 06'S 123° 23'E), about 594 nautical miles inland from Dumont D'Urville.

L'Astrolabe operates in seas which are cold, and at times very rough. As a precaution against water ingress, the vessel's watertight doors are secured by dogs and additional lashing straps. These lashing straps are made fast to strong points welded on the interior of the doors and strong points on the deck. The vessel's after deck, like all supply vessels, is open and has a very low freeboard. As a result of this, company procedures prohibit personnel venturing onto this deck at night and when the vessel is not conducting oceanographic research.

Figure 3: Route map



When conducting oceanographic research, personnel are required to wear life belts, with life lines attached to strong points. A camera is also installed to allow the crew on the navigation bridge to observe the after deck and personnel working there. This camera is removed when no operations are being conducted from the after deck.

3.2 The incident

3.2.1 Man overboard

L'Astrolabe sailed from Dumont D'Urville on Saturday 22 January 2005 bound for Hobart. On board were the 12 crew and 35 researchers returning from the French base.

At 0355 ESST³ on 27 January, the mate was making his way to the navigation bridge to take over the watch from the second mate. On his way, he visited the mess room. He said good morning to the 4–8 lookout, who was seated in the mess prior to him coming on duty. The man returned the greeting. The mate continued to the bridge and relieved the second mate, who then went to the duty mess for something to eat, before going to his cabin.

The weather that morning was south-westerly winds of about ten knots, and slight seas on a long, low 0.5 m south-westerly swell. Visibility was very good and civil twilight⁴ began at about 0522. Sunrise was expected at about 0600. The moon had risen at about 2200 the previous night and was due to set at about 0710 that morning.

At about 0405, the mate, concerned that his lookout had not arrived on the bridge, sent the 12–4 lookout down to the mess to see if the man was still there. He returned to the bridge after about ten minutes and informed the mate that the man was not in the mess or in his cabin. The mate then sent the seaman to have a thorough look through the accommodation, bosun's store, and to check all the watertight doors leading onto the exposed weather decks.

At about 0425 the lookout returned to the bridge and told the mate that the watertight door leading from the cargo compartment onto the after deck was only partially secured. The dogs were loosely closed and the lashing strap was not secured. At 0430 the mate called the master and informed him of the situation.

The master came to the bridge and the mate gave him a complete briefing of the incident. The master then went to the stern watertight door to see for himself how the lashings were found. He returned to the bridge and, thinking that the 4–8 lookout might have fallen overboard, he instructed the mate to turn the vessel around and to set a reciprocal course for the 0400 position, which was approximately 46° 45'S 146° 32'E (235 nautical miles from Hobart). The turn was made at about 0445.

He then informed his agent in Hobart of the man overboard situation developing and of his intention to return to the position the vessel was in at 0400, when the man was last seen. The agent then passed that information to the Rescue Coordination Centre in Canberra (RCC Australia).

At 0500, the master sounded the general alarm. The passengers mustered in the lounge and the crew mustered on the bridge. The master informed the crew of the situation and instructed them to conduct a search of the entire vessel. As there was only a small number of crew available to search the vessel, several of the passengers were asked to assist. The search of the ship failed to locate the missing seaman.

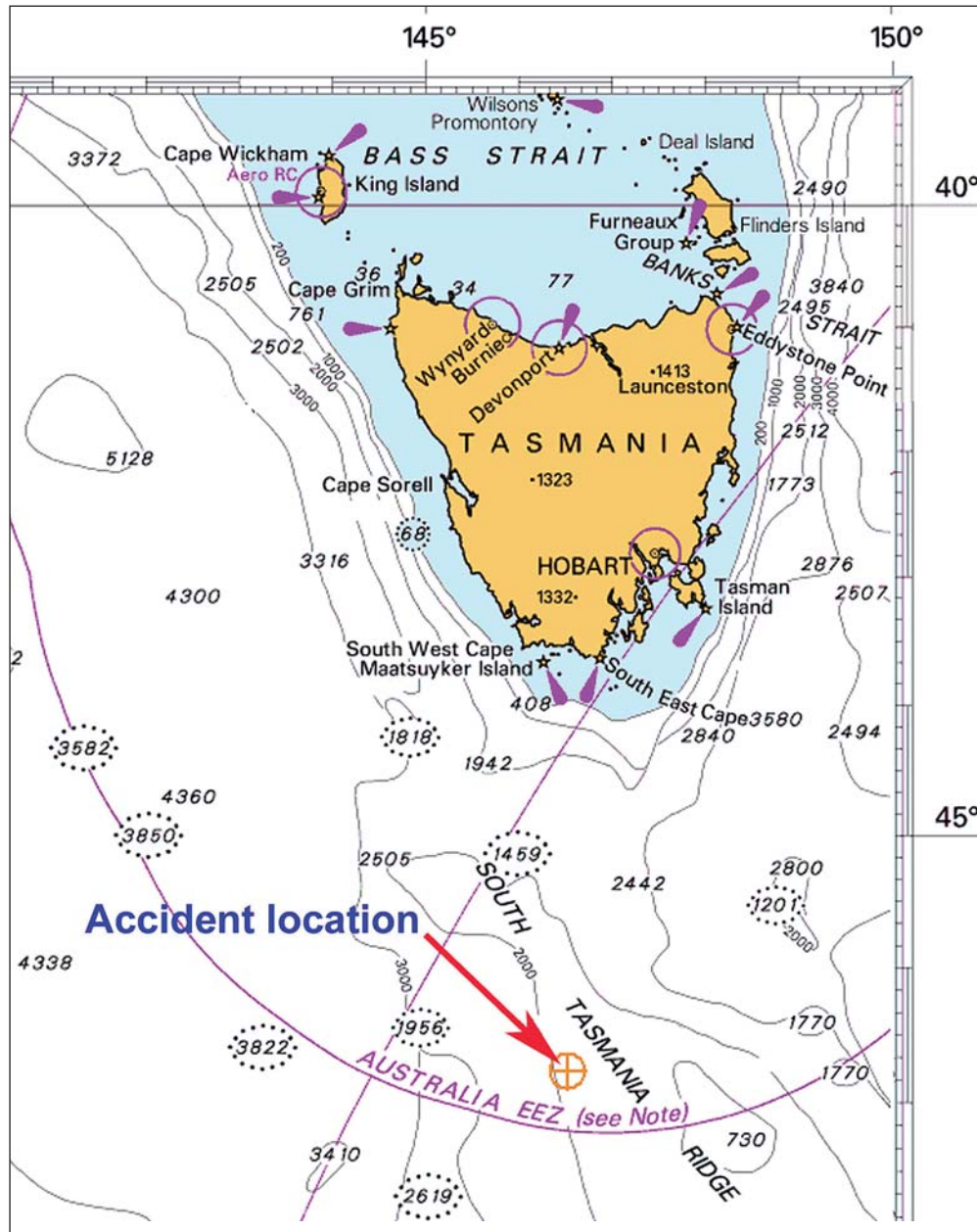
3 Eastern Standard Summer Time (UTC +11)

4 The time when the centre of the sun is at a depression angle of six degrees below an ideal horizon (from 6° to 0° below the horizon).

After the search was completed, the master was certain that he was facing a man overboard situation. All available crew and the passengers were then asked to proceed onto the bridge wings and helideck to act as lookouts, while the ship made its way to the area in which the master would start the search.

At about 0530, the search for the missing 4–8 crew member began while the master took the vessel to the area in which he went missing. The master’s intention was to take the vessel about two nautical miles south of the 0400 position and alter course to resume the original heading and conduct a more formal search of the sea.

Figure 4: Portion of chart Aus4074 showing location of man overboard



At 0601, RCC Australia issued an urgency (PAN PAN) broadcast via INMARSAT-C. The broadcast advised mariners transiting the area of the possible man overboard and to contact *L’Astrolabe* and assist in the search as required.

At 0604, the master spoke directly to RCC Australia and requested the assistance of a search aircraft to find the missing man. RCC Australia had, at 0557, already

organised a twin engined aircraft, and observers, to depart from Hobart for the search area as soon as possible.

At about 0630, the master began the formal search in accordance with the International Aeronautical and Maritime Search and Rescue (IAMSAR)⁵ manual kept on board. The search legs were at 0.5 nautical mile track spacing, and extended about 0.5 nautical miles either side of the original course.

At 0705, a search aircraft departed from Melbourne. It was to refuel on arrival in Hobart and then proceed to the search area. At 0753, a Hobart based search aircraft departed Hobart airport. It was due in the search area at 0847.

At 0824, the forward-facing lookouts on board *L'Astrolabe* saw a number of large sea birds off the port bow of the vessel. These birds were approximately two cables (0.2 nautical miles) from the vessel and perched on, or flying over, an object in the water. Through binoculars, it was soon apparent that the birds were flying over the missing man, however it was not known if the man was alive.

As the vessel did not have a small, easily manoeuvrable rescue boat, preparations were made to launch the port totally enclosed lifeboat. The mate, second mate and second engineer boarded the lifeboat while it was stowed in its davits. At 0835, when these three men were secure inside the lifeboat, the bosun, standing at the deck winch, lowered the boat to the water. The mate acted as the lifeboat's coxswain and, using the on-load release lever at the coxswain's position, released the falls when the lifeboat became waterborne.

Travelling time from the ship to the location of the 4–8 crew member in the water was about five minutes. The mate brought the lifeboat alongside the 4–8 crew member and it became immediately evident that the man was deceased. The second mate and second engineer pulled the man from the sea, and laid him on the floor of the lifeboat. The master was then advised by portable VHF radio that the man was deceased. The mate then proceeded to take the lifeboat back to *L'Astrolabe* for recovery.

Shortly after the 4–8 crew member was lifted into the lifeboat, the search aircraft arrived in the search area. However, rather than have the aircraft return immediately to Hobart, RCC Australia requested it remain in the vicinity of *L'Astrolabe* until the lifeboat had been recovered aboard the vessel. The aircraft from Melbourne was held on the ground in Hobart (where it had landed to refuel) and did not proceed further south.

3.2.2 Accident on lifeboat

During the time between when the 4–8 crew member went missing and his recovery, the weather had remained almost unchanged. The south-westerly swell had remained long but its height had increased to an estimated 1.5 m to 2.0 m.

In preparation to recover the lifeboat, *L'Astrolabe's* master kept the ship's heading so the vessel remained steaming with the swell. He did this from the helm position in the wheelhouse and therefore could not observe the lifeboat recovery operation.

⁵ Jointly published by International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO), the three-volume IAMSAR Manual provides guidelines for a common aviation and maritime approach to organising and providing search and rescue (SAR) services.

The mate brought the lifeboat back to the port side of *L'Astrolabe* and made several approaches from astern of the falls, which were hanging freely from the davits. The second mate was leaning through the forward access hatch of the lifeboat, preparing to grab the forward fall block and attach it to the forward fall hook on the lifeboat. The second engineer was doing the same at the after end of the lifeboat.

Neither fall had been secured to the lifeboat's forward painter when the lifeboat was released from the falls prior to recovering the 4–8 crew member. As the falls were hanging freely, the mate was attempting to position the lifeboat between the two falls, using the motor alone. No one on either the lifeboat or *L'Astrolabe* had considered passing a painter to the lifeboat.

Because of the effect of the swell, the men at either end of the lifeboat had trouble taking hold of the fall blocks. Once they had hold of the blocks, they also experienced difficulty in placing them on the lifeboat's hooks. The second mate was able to attach his fall block after two attempts; however it did not remain in place without his assistance.

The second engineer, on his third attempt to grab the free swinging fall block, got his right hand caught between the block and hook assembly of the lifeboat. This resulted in the thumb on this right hand being almost severed. After the contact, the thumb was left attached to his hand by a small amount of skin.

The two other men in the lifeboat were alerted to the accident by the shout of pain from the second engineer. The mate was unable to leave the coxswain's position, so the second mate rushed aft and assisted the engineer into the lifeboat. He was then able to quickly wrap the engineer's hand in a cloth and then returned to the after end of the lifeboat to try and attach the fall block to the hook.

The movement of the lifeboat in the seaway continued to provide difficult conditions in which to attach the fall blocks to the hooks at either end of the lifeboat. The fall blocks kept coming out of the hooks and this necessitated the second mate moving quickly between the fore and aft end of the lifeboat to reattach the blocks while the mate manoeuvred the lifeboat.

After about one hour of attempting to attach the blocks, two painters were lowered from *L'Astrolabe* and used to secure the lifeboat alongside the ship. The falls were then raised a small amount and pulled closer to the ship by the crew on board *L'Astrolabe*, using boat hooks. They were then lowered at a controlled rate to the lifeboat. The blocks were then able to be attached to the hooks and, as the lifeboat's movement was decreased by being alongside the vessel, the blocks remained in position. The lifeboat was then recovered from the water.

By 0940, the lifeboat was safely on board *L'Astrolabe*. The entire recovery operation had taken about 70 minutes.

Once the lifeboat was stowed, the two doctors on board the vessel went inside the lifeboat to check on the condition of the second engineer and of the 4–8 crew member recovered from the water. After being examined, the engineer was taken to the ship's hospital. The deceased 4–8 crew member was taken to an empty refrigerated container in the ship's working area, where he remained for the remainder of the voyage.

At 0956, RCC Australia cancelled the urgency broadcast when the master notified them that the lifeboat had been recovered. At 0959, the search aircraft departed *L'Astrolabe*'s position and returned to Hobart.

At 1000, *L'Astrolabe* resumed its voyage to Hobart where it berthed on the morning of 28 January. Once the vessel was alongside, the deceased 4–8 crew member was taken ashore by local authorities. The second engineer was admitted to hospital and underwent bone graft surgery that evening to reattach his thumb.

3.2.3 Lifeboat damage

During the recovery operation, the lifeboat suffered a significant amount of damage from both the swinging fall blocks and from contact with the hull of the ship.

This damage included cracks in the lifeboat hull, the forward and after access hatches were partially pulled from the canopy, and the forward handhold adjacent to the access hatch was totally ripped from the canopy (Figures 5–9).

The damage was repaired in Hobart and *L'Astrolabe* was cleared to continue its operations by its Classification Society and the Australian Maritime Safety Authority (AMSA).

Figure 5: Port lifeboat's rear hatch damage



Figure 6: Port lifeboat's contact damage

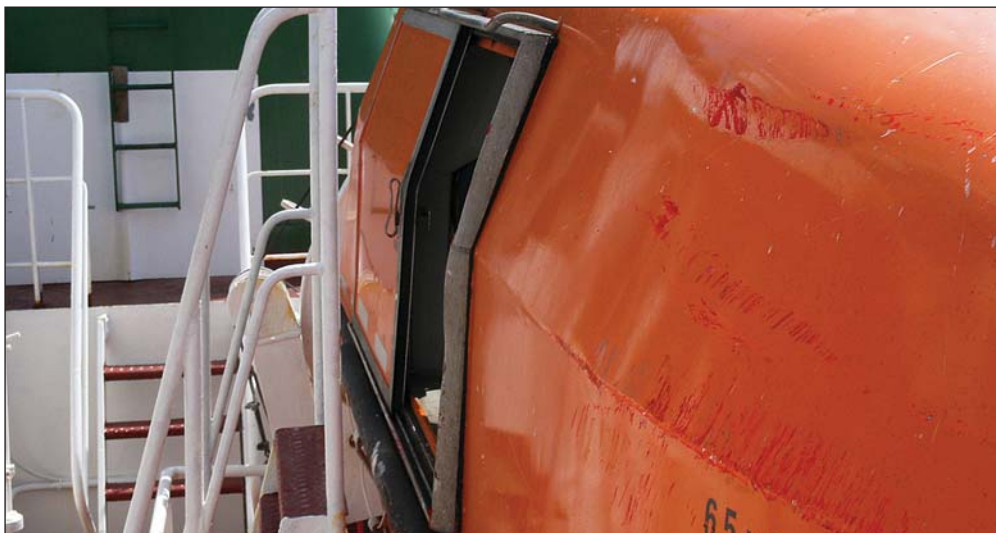


Figure 7: Port lifeboat's forward hatch damage



Figure 8: Port lifeboat's contact damage



Figure 9: Port lifeboat's forward hatch damage



4 COMMENT AND ANALYSIS

4.1 Evidence

On 28 and 29 January 2005, an investigator from the ATSB attended *L'Astrolabe* at its berth in Hobart. The master, mate, and second mate were interviewed on board and each provided accounts of the incidents, and for the period of time between the two. The second engineer was interviewed in his hospital room on 29 January. Copies of relevant ship's documentation were obtained including: deck logbook entries, position information, INMARSAT-C messages from the ship, lifeboat operating instructions, various operating procedures and statutory survey records.

Copies of statements given by the crew to police, and forensic data taken from the ship, were provided by Tasmanian Police. The Tasmanian Coroner's Office provided copies of the post mortem and police reports.

4.2 The incident

The 4–8 crew member was noticed missing after failing to report for his assigned watch duties. When an extensive search of the vessel failed to locate him, the master turned the vessel around and commenced a search of the sea in the area where the man had last been seen on board (at about 0350 that morning). The missing crew member was located in the sea about 4.5 hours after he went missing. He was deceased when found.

The missing crew member had begun to exhibit signs of depression in the days before he went missing. The post mortem examination of the deceased man revealed that he had a very high blood alcohol level present in his body. A police investigation determined that he was not deliberately pushed from *L'Astrolabe* but it was not determined if he deliberately jumped from the vessel or fell.

During the operation to recover the deceased 4–8 crew member from the sea, *L'Astrolabe's* second engineer almost lost the thumb on his right hand when his hand became caught between the fall block and the lifeboat's after hook assembly.

Neither *L'Astrolabe's* lifeboat fall blocks nor suspension rings had 'hand holds' fitted and the vessel was not equipped with recovery strops for use in the recovery of the lifeboat. The lack of hand holds, and more critically, recovery strops contributed to the second engineer's accident, and prolonged the time it took to recover the lifeboat, increasing the hazards associated with the recovery of lifeboats in a seaway.

The weather and sea conditions at the time were very good, considering the location of the vessel, although the swell did increase slightly during the search and recovery operation. The weather conditions during the search enabled the missing crew member to be located in a relatively short period of time.

4.3 Man overboard incident

4.3.1 Mental state

According to members of *L'Astrolabe's* crew who associated with the deceased 4–8 crew member, he kept to himself but was well liked on board. He suffered from sea sickness, severely at times, but had not asked for any medication from the two doctors on board the ship at any time. He was due to complete two more round trips from Hobart before he left the vessel to return home.

In the days before he went missing, he was observed to become more quiet, moody and withdrawn. He had started smoking and took to keeping his lookout duties from the bridge wing and not inside the bridge as was the normal practice on board *L'Astrolabe*. According to the crew member with whom he shared a cabin, he had stopped reading, could not sleep and spent hours staring at the bottom of the bunk above him while in bed.

The unusual behaviour indicates that there was something occurring in his life that he kept to himself. In the days leading up to the incident, he had not received or sent any emails or had any phone calls to or from his family in the Ukraine. He was not seen with any letters which could have contained disturbing news. He had also stopped filling out his on board 'overtime worked' sheets on 19 January.

Australian authorities endeavoured to obtain statements from his family in the Ukraine to establish whether they could elaborate further on his apparent state of mind. No statements were forthcoming.

4.3.2 Cause of death

A Tasmanian police investigation determined that there was no evidence that the deceased 4–8 crew member was deliberately pushed from *L'Astrolabe*. Whether he fell or consciously jumped off the vessel was not able to be determined.

A post mortem was carried out in Hobart on 28 January 2005. The forensic pathologist's finding was that he died as a consequence of drowning following alcohol intoxication. According to the pathologist's report, the 4–8 crew member 'had a very high blood alcohol level (0.286g/ml), which was probably highly significant in his death'.

The 4–8 crew member was never seen to be intoxicated on board. While alcohol is available to crew members at the master's discretion, the deceased 4–8 crew member was not seen to be consuming any on the night before he went missing. The forensic evidence, however, indicates that prior to being woken for his watch duties at 0340 on 27 January, he had consumed a large quantity of alcohol. It is possible this was acquired from the passengers' mess/lounge where alcohol is freely available. Police investigations were unable to determine where he acquired the alcohol. It is also not known where he consumed the alcohol on the evening before his disappearance. It was not in his cabin. He was seen, on at least one occasion during the voyage, sitting by himself in the enclosed cargo space.

4.3.3 Survivability in cold water

At the request of the ATSB, RCC Australia carried out computer modelling for survivability times in sea water as a result of hypothermia for this incident.

The model gives two time periods. These are based on the sea and weather conditions; air and sea temperatures; the person's age, size, weight, gender, fitness and state of exhaustion; what was being worn by the person and whether or not a life preserver was worn. The first period is overall survival time and the second is the period of time after which a person cannot help themselves to lessen heat loss from their body while in the water. This is known as 'functional time'.

A sea temperature reading of 13 degrees Celsius, and other weather conditions, was provided by the crew of *L'Astrolabe* for the area in which the 4–8 crew member went missing. RCC Australia's modelling indicates that he could have had a survival time of 15.6 hours and a functional time of 10.5 hours at that sea temperature. These figures do not take into account the alcohol that was consumed before entering the water.

The information regarding survivability time in the water is consistent with the forensic pathologist's findings that the 4–8 crew member drowned.

4.4 Lifeboat operations

4.4.1 Manning

When the master ordered the port lifeboat to be readied for lowering, only three members of the ship's crew were assigned to it. He considered that, given the weather and sea conditions at the time, three men were sufficient to safely man the boat. The three officers who took the lifeboat away were trained in seamanship (dual certificated) and lifeboat procedures and could undertake any task on board the lifeboat.

The master stated that he manned the lifeboat as he did because he did not wish to put any of *L'Astrolabe*'s seamen in the lifeboat, only officers. The master was worried that a crew member, who was a working colleague and possible friend of the missing man, could be affected emotionally as a result of seeing the state of the 4–8 crew member when he was recovered from the water.

The master wanted the lifeboat dispatched and the 4–8 crew member recovered in as short a period of time as possible. This was because he was very aware that all the crew and passengers could see the missing 4–8 crew member in the water. While no one knew whether he was alive or not, and in what condition he was in, the master knew that speculation would be rife as a result of the presence of the sea birds on or near the 4–8 crew member in the water.

4.4.2 Painters

In the haste to launch the lifeboat and retrieve the 4–8 crew member, the usual practice on board of attaching the forward painter to the forward lifeboat fall after it was let go from the lifeboat, was not followed. This meant that when the lifeboat returned to *L'Astrolabe*, the second mate in the forward section did not have anything which would have enabled him to attach the lifeboat to the ship.

Had the painter been available for him on the lifeboat's return, the task of positioning the lifeboat between the falls would have been easier and safer. It was not until one hour after the lifeboat's return that painters were lowered and the lifeboat safely recovered aboard. During that time, the engineer had suffered a severe injury and the lifeboat was extensively damaged.

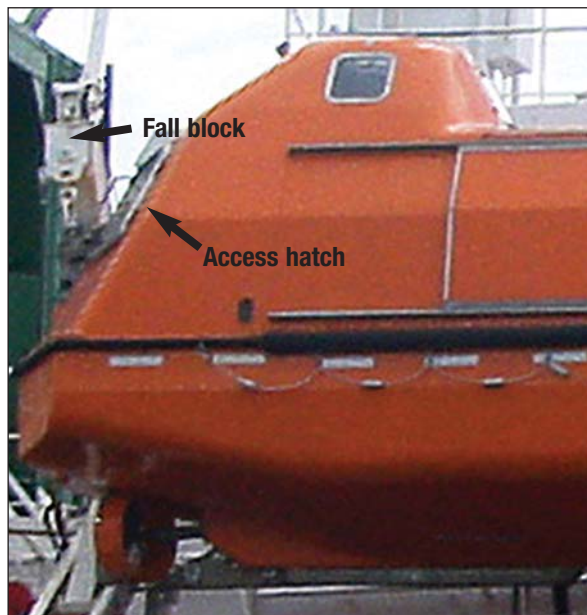
The evidence indicates that no one considered passing a painter to the lifeboat and its crew as soon as the lifeboat returned to *L'Astrolabe*. The painter could have been passed down to the second mate who, using the boathook on board, would have secured it to the forward end. Even if the state of the sea prevented the fall blocks from being safely handled, the mate on the helm could then have steered the lifeboat alongside *L'Astrolabe* and the falls blocks lowered at a more controlled manner as was later done. This might have resulted in the lifeboat recovery operation being considerably shorter.

4.5 Lifeboats

4.5.1 After access hatch

The after access hatch on *L'Astrolabe*'s lifeboats is located on the outboard side of the boat's canopy and not on the centreline. This location made the task of connecting the suspension ring on the fall blocks to the lifeboat's hook assembly extremely difficult. The crew member was required to position himself in the hatch then lean out (exposing his head and upper body to the dangers of the swinging fall block), while endeavouring to take hold of the swinging fall block or suspension ring and then manoeuvre it into position on the hook.

Figure 10: Starboard lifeboat's after access hatch



The off centre location of the hatch meant that he not only had to concentrate on keeping his hands, and head, clear of the swinging fall block, but also on maintaining his balance while leaning out through the hatch.

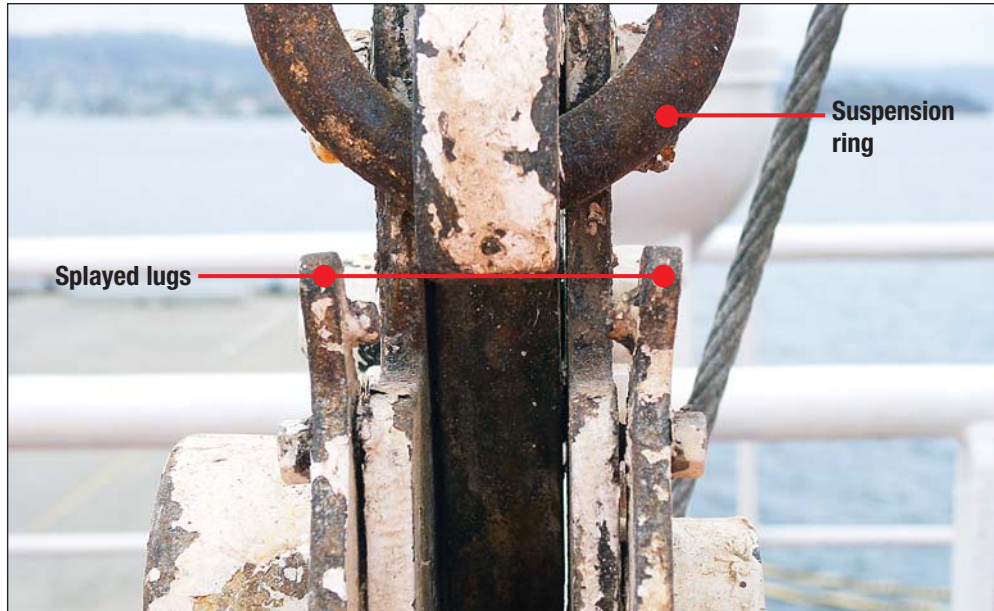
4.5.2 Lifeboat hook mechanism

Inspection of the port lifeboat's forward hook arrangement (Figures 11 and 12) revealed damage to the latch mechanism. It was not possible to tell whether the damage occurred during the incident on 27 January, or before that date.

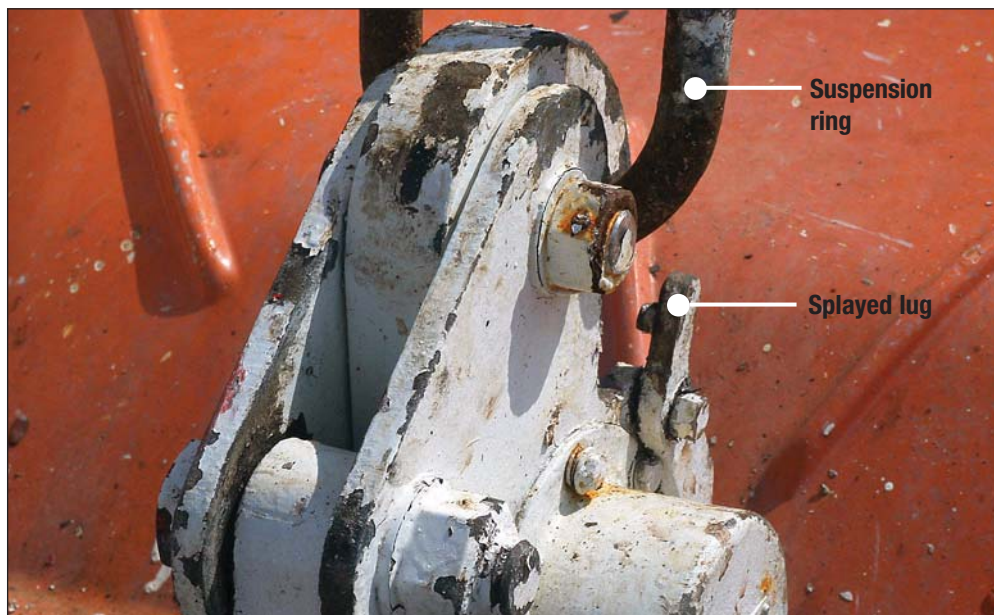
The aft latch mechanism was not damaged in this way (Figure 13).

The damage consisted of a splaying of the lugs, which had allowed the suspension ring to readily detach from the lifeboat's forward hook during the incident. It is probable that this damage added to the difficulty experienced during the recovery operation, prior to the painters being lowered to the lifeboat.

Figures 11: Port lifeboat's forward lifting assembly



Figures 12: Port lifeboat's forward lifting assembly



Figures 13: Port lifeboat's after lifting assembly



4.5.3 Fall blocks and suspension rings

The fall blocks and suspension rings on *L'Astrolabe's* lifeboats (Figure 14) did not have 'hand holds' attached to them. 'Hand holds' would have enabled the crew members to easily grasp the fall block or suspension ring without placing their hands in direct contact with the blocks or rings.

The lack of 'hand holds' increased the likelihood that the crew of the lifeboat would have had to place their hands between the blocks/rings and the lifeboat or its fittings in order to connect the suspension ring to the lifeboat hook.

Figure 14: Port lifeboat's forward lifting assembly



4.5.4 Recovery strops

The requirement for a vessel to carry recovery strops for its rescue boat is contained in SOLAS Chapter III Regulation 17(5). This regulation states:

Rescue boat embarkation and recovery arrangements shall allow for safe and efficient handling of a stretcher case. Foul weather recovery strops shall be provided for safety if heavy fall blocks constitute a danger.

Recovery strops are lengths of nylon or polypropylene rope with eyes at either end. They are fitted to a lifeboat's fall block suspension rings after the boat has been let go by the crew remaining on board a ship (usually by a 'D' shackle). They enable the boat crew, on return to the falls, to easily take hold of the strops and not the heavy fall block and suspension ring, slipping the eye over the lifeboat's forward and after

hooks. The boat is recovered from the water and its occupants disembark. The boat is then made fast to the davit head with a wire strop (or similar), the falls slackened off, the fall blocks lowered and the suspension rings slipped over the boat's hooks. The lifeboat can then be stowed as normal.

The very reason recovery strops are required is to prevent an injury such as *L'Astrolabe's* second engineer's from happening. A crew member in a lifeboat has only to grab hold of a relatively light rope and not a dangerous swinging fall block.

L'Astrolabe's totally enclosed lifeboats were fitted when the ship underwent conversion for polar operations in 1988. The port lifeboat was the designated rescue boat but the ship was not equipped with recovery strops for either lifeboat. However, the SOLAS requirement for the use of recovery strops only applies to vessels built after 1 July 1998. As such, *L'Astrolabe* was not required to carry them.

Given the area of operation of the vessel, and the inherent risks associated with a crew member safely handling a fall block from a restrictive access hatch, it would have been prudent for the operators of *L'Astrolabe* to have provided the vessel with recovery strops for both lifeboats.

Figure 15: Man-overboard events and causal factors chart

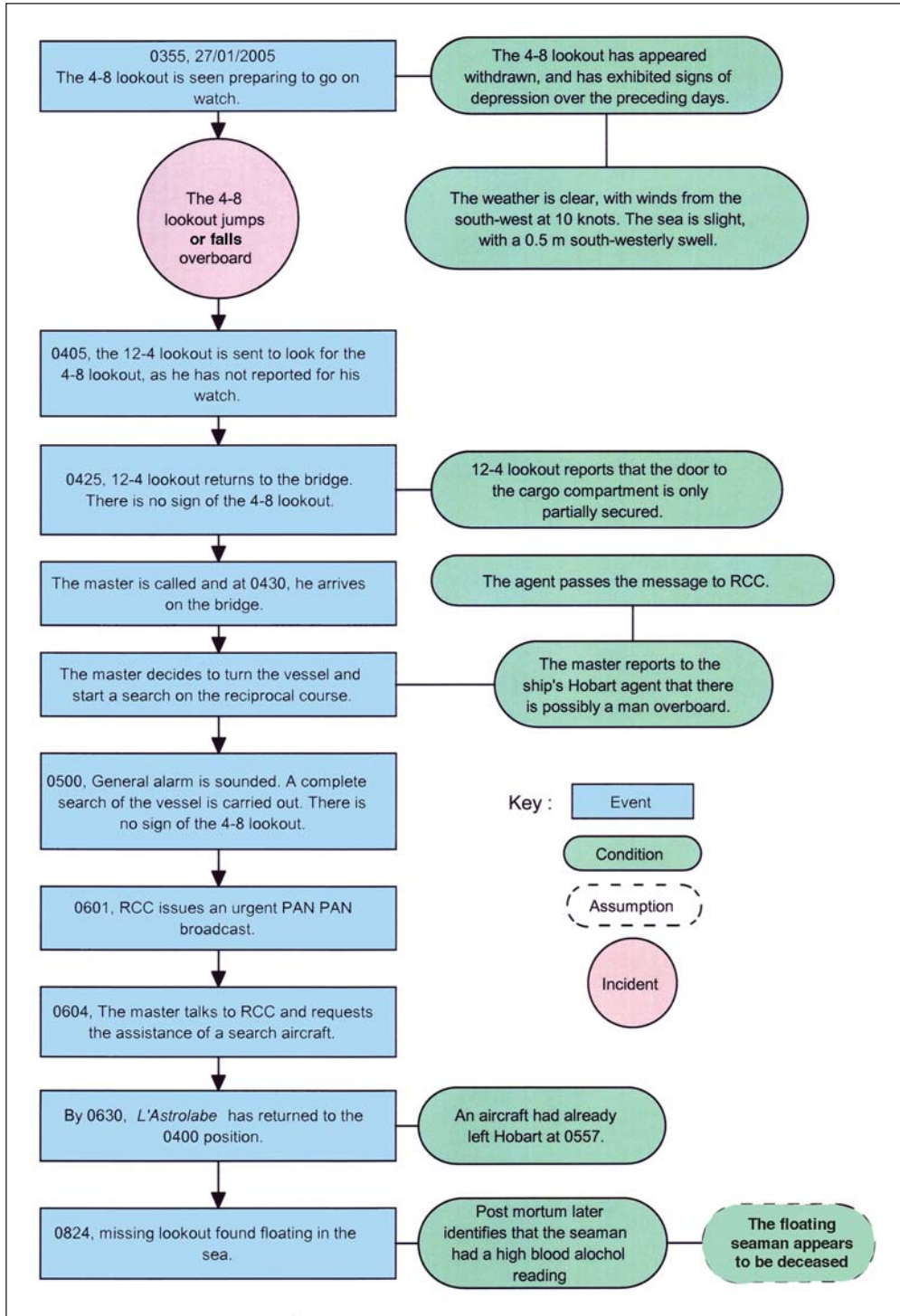
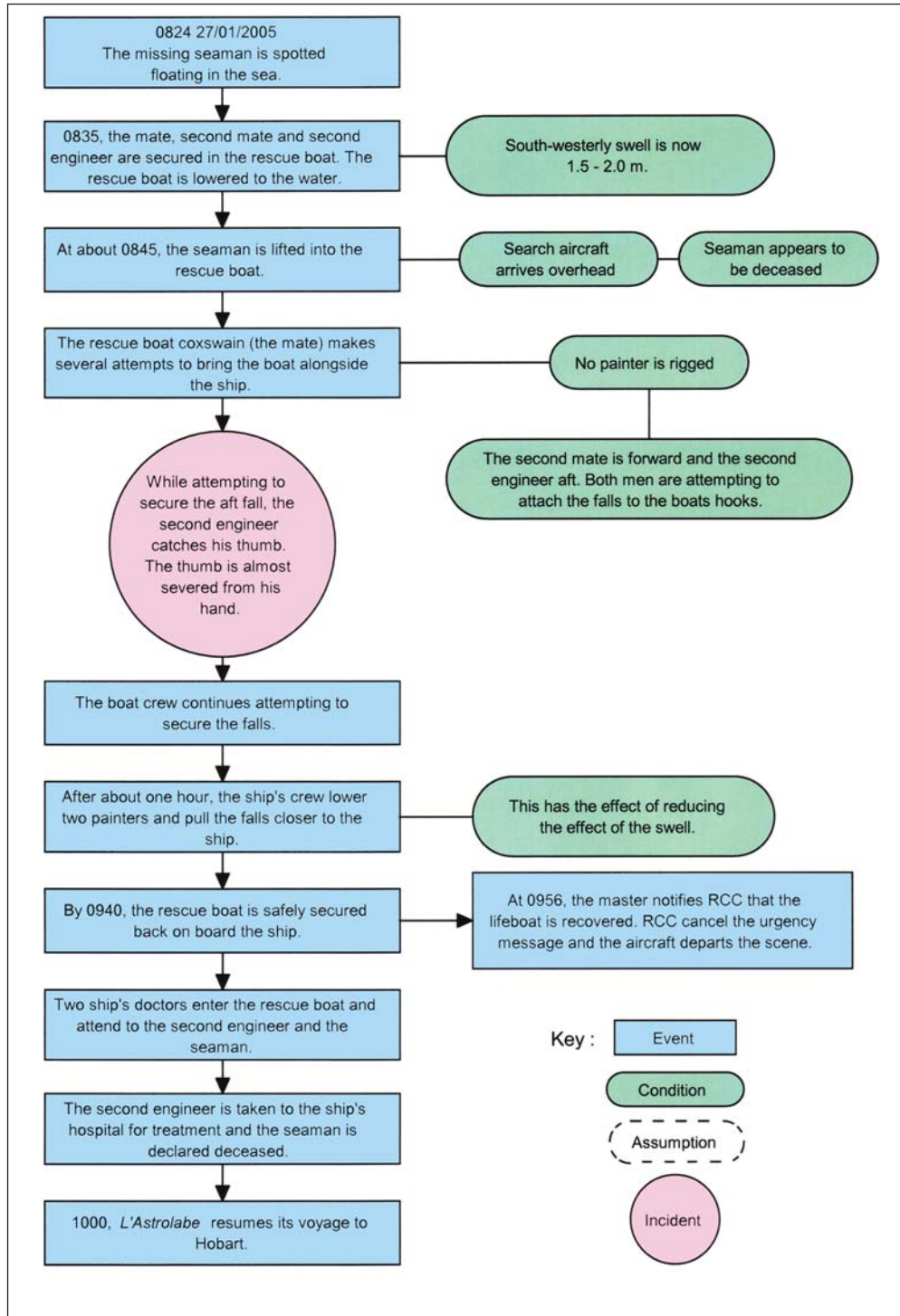


Figure 16: Lifeboat accident events and causal factors chart



5 CONCLUSIONS

These conclusions identify the different factors that contributed to the incident 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 man overboard and subsequent lifeboat accident on 27 January 2005:

1. The deceased 4–8 crew member jumped or fell overboard while in an intoxicated state, after a period of time during which he was exhibiting signs of depression.
2. The 4–8 crew member had died as a result of drowning before the vessel was able to locate him.
3. A very high blood alcohol level found during the post mortem examination of the deceased 4–8 crew member was probably highly significant in the circumstances of his death.
4. A painter was not left attached to the forward fall block when the lifeboat departed *L'Astrolabe* to recover the deceased 4–8 crew member.
5. The vessel's movement in the seaway made the lifeboat recovery operation difficult, and resulted in damage to the lifeboat and its fittings.
6. The second engineer suffered a severe injury to his right hand as a result of it becoming caught between the fall block and hook assembly on the port lifeboat.
7. Neither the fall block nor the suspension ring had 'hand holds' attached to them, which meant that the crew in the lifeboat had to manhandle the blocks and rings directly.

It is also considered that:

8. While *L'Astrolabe*'s lifeboats were not required to have foul weather recovery strops fitted, their presence would have removed the danger that the swinging fall blocks presented to the lifeboat crew.

6 RECOMMENDATIONS

MR20050018

Owners, operators and masters of vessels fitted with totally enclosed lifeboats should consider replacing suspension rings attached to the lifeboats' fall blocks with suitably designed rings with 'hand holds' attached.

MR20050019

Owners, operators and masters of vessels should consider the provision of foul weather recovery strops for use with the designated rescue boat on board.

MR20050020

The owners and masters of *L'Astrolabe* should consider the introduction of a more rigorous system of monitoring alcohol consumption by the crew on board the vessel.

MR20050021

The Flag State should consider referring the issue of foul weather recovery strops to the International Maritime Organization (IMO) for consideration.

7 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 *L'Astrolabe's* master, mate, second mate and second engineer, the Tasmanian Coroners office, Page Seager Lawyers, AMSA and the Bureau d'enquetes sur les evenements de mer.

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

IMO Number	8418198
Previous names	<i>Fort Resolution</i> (1986) <i>Austral Fish</i> (1988)
Call sign	FHZI
Flag	French Antarctic Territory (FAT)
Port of Registry	Port-aux-Francais
Classification society	Bureau Veritas (BV)
Ship Type	Multi-purpose offshore support vessel
Builder	Ferguson-Ailsa Shipbuilders, Port Glasgow, Scotland
Year built	1986
Owners/managers	SURE, Marseille, France
Ship charterers	French Polar Institute
Gross tonnage	1 371
Net tonnage	525
Deadweight (summer)	949 tonnes
Summer draught	4.782 m
Length overall	65.36 m
Length between perpendiculars	58.32 m
Moulded breadth	13.06 m
Moulded depth	12.80 m
Engines	2 x Mirrlees 8MB275 diesel (each of 2 300 kW)
Total power	4 600 kW
Service speed	12 knots
Crew	12 (France, Ukraine)

Ship's officer injured recovering dead colleague from the sea

An Australian Transport Safety Bureau (ATSB) investigation report released today recommends that ship owners, operators and masters with totally enclosed lifeboats on their ships should consider fitting lifting rings with 'hand holds' attached to them, and the provision of foul weather recovery strops.

The ATSB report into the accident on board the French Antarctic support vessel *L'Astrolabe* states that, at about 0355 (local time) on 27 January 2005 a crew member on board the ship either jumped or fell from the ship into the Southern Ocean. In the days before the crew member had been exhibiting signs of depression and he was intoxicated at the time he went overboard.

The ship was 235 nautical miles to the south of Hobart at the time, and was returning from the French Antarctic base of Dumont D'Urville.

When it was discovered that the crew member was missing, a search of the ship and sea was initiated by the ship's master. The crew member was found in the sea, about 4.5 hours after being reported missing. He was deceased when found.

One of the ship's lifeboats was used during for recovery of the deceased crew member. The relative movement between the ship and the lifeboat in the two metre seaway during the lifeboat recovery operation caused damage to the lifeboat, its fittings and the injury of one crew member. The second engineer almost severed his thumb when he caught his right hand between the swinging lifeboat fall block and the lifeboat hook assembly.

Neither the fall block nor the suspension ring had 'hand holds' attached, and the ship was not outfitted with foul weather recovery strops, thus the crew were required to manhandle the blocks and rings.

Copies of the report can be downloaded from the ATSB's internet site at www.atsb.gov.au, or obtained from the ATSB by telephoning (02) 6274 6478 or 1800 020 616.