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Man overboard fatality from the research survey ship *Geosounder* 25 August 2007

ABSTRACT

At about 0310¹ on 25 August 2007, while the research ship *Geosounder* was about 185 miles² northeast of Cairns, Australia, en route from New Zealand to Singapore, an off-duty integrated rating (IR) fell overboard. The crew immediately threw lifebuoys into the water, stopped the ship and launched the fast rescue craft (FRC) but the IR could not be located. While launching the FRC to search for the missing man, another IR broke his ankle.

Figure 1: *Geosounder*



FACTUAL INFORMATION

Geosounder

Geosounder (IMO: 7208455) is a Norwegian registered research survey ship. Originally named *Anne Bravo*, the ship was built in Germany in 1972 and was renamed *Geosounder* in November 2006.

The ship (Figure 1) is owned and managed by Geoshipping, Norway, and operated by DOF Subsea, Australia. It is registered on the Norwegian International Register (NIS) and

1 All times referred to in this report are local time, Coordinated Universal Time (UTC) + 10 hours.

2 A nautical mile of 1852 m.

classed with Det Norske Veritas (DNV).

Geosounder has an overall length of 59.5 m, a beam of 10.2 m and a deadweight of 1008 tonnes at its maximum draught of 4.05 m.

The ship's propulsion is provided by a single ten cylinder B&W Alpha 10V23HU medium speed diesel engine that delivers 920 kW to the single controllable pitch propeller (CPP). This gives the ship a service speed of about 10 knots³.

Geosounder is equipped with a Norsafe Merlin 5.8 m FRC, fitted with a 90 horsepower Yamaha outboard motor.

At the time of the incident, *Geosounder* had a crew of 13. The master was Norwegian, the mates were Australian, the second and third engineer were Filipino and the chief engineer, electrician and remaining crew were New Zealand nationals.

The master had been at sea since 1977. After starting his career as a deck boy and sailing on a variety of ships at different ranks, he gained his certificate of competency as a master for vessels less than 3000 gross tons in 1989. He had been master of *Geosounder* since 2002. On 5 August 2007, he rejoined the ship after a period of leave.

The chief mate first went to sea in 1988. He gained an Australian certificate of competency as master class 1 about three weeks before the accident. At the time of the accident, he was on his third four-week assignment on board the ship as chief mate. Like the master, he had rejoined it on 5 August.

The second mate had been at sea since 1974. After starting his career in the fishing industry, he had worked on a variety of small vessels as master and mate. He held a master class 3 certificate of competency, issued in Victoria, Australia. It was his second four-week assignment on board *Geosounder*.

The boatswain had been at sea since 1976 and had worked on a variety of vessels. He held a New Zealand certificate as Able Seaman and a New Zealand coastal fishing skipper's ticket. He had been on board *Geosounder* for about six months and this was his first assignment on board the ship as boatswain.

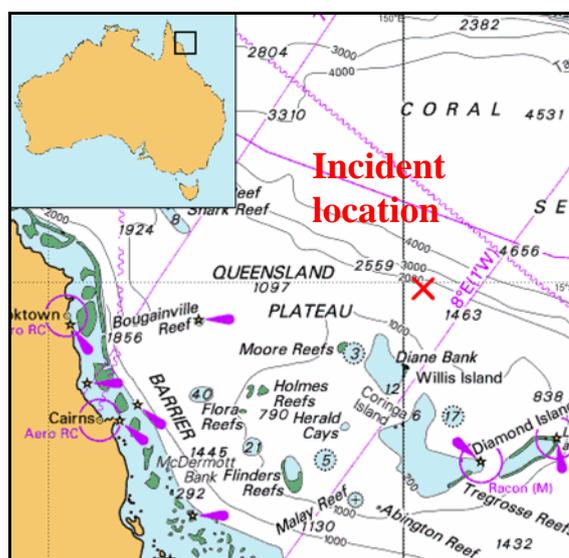
The IR who was lost overboard (IR1) had been at sea for about 25 years, had worked on a wide variety of ships and had been on board *Geosounder* for about six months.

The IR who was injured in the FRC (IR2) had been at sea for about 25 years. He had also been on board *Geosounder* for about six months.

The incident

On 15 August 2007, *Geosounder* departed from Tauranga, New Zealand, bound for Singapore via the Torres and Lombok Straits. The ship had completed its contract in New Zealand and was to undergo a brief refit before deploying to India.

Figure 2: Section of chart Aus 4060



The weather during the first few days of the voyage was very poor. As the ship approached the Queensland coast, the weather started to improve and by 23 August, the wind had eased to force⁴ four (11 - 16 knots) from the south with a 1 m sea on a 0.5 to 1.0 m southerly swell. The ship was making good a course of 314°(T), which put the seas on the ship's port quarter.

On 24 August, the master asked the crew to prepare a barbeque dinner on deck for that evening. During the afternoon, the crew set up the barbeque on the boat deck, abaft and one deck below the bridge. The master provided the crew

3 One knot, or one nautical mile per hour equals 1.852 kilometres per hour.

4 The Beaufort scale of wind force, developed in 1805 by Admiral Sir Francis Beaufort, enables sailors to estimate wind speeds through visual observations of sea states.

with three cases of full strength beer which was placed in a cool room ready for the barbeque.

At sea, the master kept the eight to twelve watch the chief mate kept the four to eight watch and the second mate the twelve to four watch. On 24 August, the chief mate and the second mate split the master's watch so that the master could stay at the barbeque. The chief mate was due to be relieved by the second mate at 2200.

The seaman assigned to the four to eight watch with the chief mate, IR1, usually undertook regular ship rounds or maintenance work during the watch and reported to the bridge every two hours. On the evening of the barbeque, the chief mate told him that there were no specific tasks to be undertaken so IR1 joined the other crew at the barbeque.

That evening, the weather was pleasant and the ship was rolling gently up to about five or ten degrees to the southerly swell.

At 1630, the barbeque was lit and the crew began eating and drinking. The chief mate remained on the bridge during the barbeque and had his dinner brought to the bridge. All of the other crew, including IR1, ate and drank on the boat deck.

At about 1930, the remaining food was packed away. The chief mate suggested that the crew who were still at the barbeque should move down to the shelter deck after eating dinner so that they could continue to socialise and listen to music without disturbing the rest of the crew who were not in attendance.

The master had been at the barbeque and had consumed about eight cans of beer before going to bed at about 2200. During the evening, several of the crew went on watch or left the barbeque and went to bed. At about 2230, the ship passed through a rain shower so the remaining crew went inside to the recreation room.

At about 0100 on 25 August, after the electrician went to bed, only IR1 and the boatswain remained socialising. At about 0230, they decided to go and sit on the forecastle and watch the stars. After greeting the second mate as they passed through the wheelhouse, they went forward.

At about 0300, they again passed through the wheelhouse, greeted the second mate again, and went aft.

At about the same time, IR2 who had been assigned to the twelve to four watch, was conducting his rounds. He passed IR1 and the boatswain while they were near the shelter deck portside handrail (Figure 3).

The two IRs, who had been friends for many years, joked together for a few minutes before talking about the trip to Singapore and a possible stopover in Bali. IR2 suggested that they would be able to go swimming there. IR1 said, jokingly, 'Why wait? Let's go now!' and he pretended to vault over the ship's handrail.

At about 0310, as IR1 pretended to vault the rail, his movement was amplified by the ship's motion so that he overbalanced and fell over the port handrail and into the sea.

Both IR2 and the boatswain saw IR1 overbalance and they reached out to grab him but were unable to prevent him falling overboard.

Figure 3: Handrail that IR1 fell over



The boatswain immediately rushed to a nearby man overboard (MOB) alarm button and pressed it. IR2 threw a lifebuoy overboard before going to the starboard side to get another lifebuoy which he also threw overboard on the port side.

The boatswain did not hear an alarm sounding so he hit the MOB alarm button several more times before running up to the bridge to alert the second mate.

On the bridge, the second mate heard an alarm and, on investigation, realised that it was a man overboard alarm. He immediately pulled the CPP control lever back to zero pitch and then switched to hand steering and turned the ship to port.

He rang the general alarm for about four or five seconds and pressed the MOB button on the Global Positioning System (GPS) unit to mark the

ship's position, 15°04.47'S, 150°16.24'E. He then alerted all of the crew using the public address system.

The chief mate and the third engineer arrived on the bridge in response to the general alarm and, assisted by IR2, prepared to launch the FRC, located immediately behind the bridge.

The master arrived on the bridge at about the same time and, after noting the actions taken by the second mate, he went to assist with launching the FRC.

The chief mate, the third engineer and IR2 boarded the FRC and the master lowered it to the water. As the FRC reached the water, IR2 released the painter and the chief mate started the engine. The boat surged ahead but, because it was still attached to the hoisting cable, it jerked to a stop, throwing IR2 forward in the boat, twisting his leg and breaking his ankle.

The chief mate and master wanted to hoist the FRC again to allow IR2 to receive treatment for his broken ankle but IR2 insisted that they continue to search for IR1.

The master then went into the bridge and took over the conduct of the ship. He could see the lights of the lifebuoys in the water so he turned the ship towards them.

After searching the area around the lifebuoys using the ship's searchlight and the FRC without success, the master formulated a search pattern based on the MOB position on the GPS and the prevailing wind and sea conditions.

At 0338, the FRC returned to *Geosounder* and the crew lifted the injured man onto the deck of the ship before continuing the search.

At 0420, the master contacted the ship operator's designated person ashore and advised him of the incidents.

At 0424, an hour after IR1 had fallen overboard, the master sent a distress message using the ship's GMDSS⁵ communication equipment. At 0440, the distress message was acknowledged by Taupo Maritime Radio in New Zealand which then passed it on to the Australian rescue coordination

centre in Canberra (RCC). At 0455, RCC telephoned the ship.

At 0510, the FRC was recovered and the ship continued to search for the missing man.

At 0705, a search aircraft from Cairns arrived on scene and began an aerial search, while the ship continued to search following the wind and current. The aircraft continued to search all day, except between 1000 and 1315 when it returned to Cairns to refuel.

At 1130, a passing merchant ship, *Iron Knight*, joined the search and continued assisting *Geosounder* and the aircraft until 1803 when it had become too dark to visually locate anyone in the water.

At 1835 on 25 August, the master, in consultation with RCC, called off the search and set *Geosounder* on course for Cairns where the injured crew member could be landed.

At 1820 on 26 August, the master conducted a brief memorial service on deck for the lost crew member.

At 0245 on 27 August, *Geosounder* berthed in Cairns and the injured crew member was taken to hospital for treatment.

ANALYSIS

Man overboard

In total, three cases of full strength beer, a total of 72 cans, were provided for the barbeque on 24 August for the 13 man crew, an average of about five cans per man. Several of the crew did not drink and some of them only had a few beers before going to bed. Based on the reported and estimated numbers of cans consumed by various crew members, it can be estimated that IR1 had consumed between ten and twelve cans of beer between about 1630 on 24 August and 0300 on 25 August. He was reportedly in good spirits when he jokingly pretended to vault over the handrail.

At about 0310, when he fell overboard, IR1 had only had about three hours of sleep in the previous 24 hours and he had not gone to bed in preparation for going on watch at 0400. An analysis of his work and rest hours suggests that he would probably have begun to experience the effects of fatigue.

5 Global Maritime Distress and Safety System.

At about 0230, the second mate thought that IR1 was a little unsteady on his feet when he passed through the wheelhouse. He was probably affected by fatigue and by his alcohol intake at that time. This, in turn, would have affected his judgement, resulting in his skylarking on the shelter deck handrails in the first place, but also his ability to recover from overbalancing once he had started to fall over the railing.

Alcohol policy

At the time of the incident, *Geosounder* was managed by Geoshipping and was being operated by DOF Subsea. Geoshipping had implemented its safety management system policies and procedures on board the ship and DOF Subsea Australia had accepted that these procedures were consistent with their requirements.

Geoshipping had a 'no alcohol' policy for its ships. Consequently, *Geosounder* was operated as a 'dry ship' with no alcohol being permitted to be consumed on board.

It was the master's responsibility to enforce the policy and, while the ship was undertaking research voyages, he had apparently enforced it.

However, for the voyage from Tauranga to Singapore, the master considered that it would be a pleasant trip without the hazards associated with the ship's normal operations. In violation of the company's 'no alcohol' policy, he purchased ten cases of beer for the voyage which he allowed the crew to drink at his discretion.

When the master provided the beer for the barbeque, he did not impose any limits on the number of cans that could be consumed by any individual crew member or a time at which they had to stop drinking.

In fact, by providing 72 cans of beer for the barbeque on 24 August, the master gave his tacit approval for the consumption of an excessive quantity of alcohol by some members of the crew. The master consumed about eight cans of beer himself before going to bed, a significant quantity of alcohol. Several other members of the crew also consumed a similar quantity.

The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended 1995 (STCW95),

details the obligations and requirements for safely maintaining watches on board a ship.

Regulation VIII/1, 'Fitness for duty', includes the requirement that:

... the efficiency of all watchkeeping personnel is not impaired by fatigue and that duties are so organised that the first watch at the commencement of a voyage and subsequent relieving watches are sufficiently rested and otherwise fit for duty.

Therefore, under STCW95, the master and the ship's officers have a 'duty of care' to ensure that the ship's watch-keepers are fit for duty.

IR1 was scheduled to go on watch at 0400 but he had not rested after dinner. He had remained on the after deck drinking with other members of the crew. Neither the master nor the ships officers effectively monitored IR1 to ensure that he had stopped consuming alcohol and was adequately rested before going on watch.

While the Geoshipping safety management system included a 'no alcohol' policy, it was not consistently and effectively implemented on board the ship. Neither the master nor the ship's officers fulfilled their STCW95 'duty of care' obligations by ensuring that all of the crew were sober, adequately rested and fit for duty

Use of the fast rescue craft

The crew launched the FRC very quickly after IR1 fell overboard. The boat was manned by the chief mate, the third engineer and IR2. It was lowered to the water by the master.

The ship had a muster list which detailed the personnel and their task allocation for launching the FRC. The ship also undertook a MOB drill every month where the FRC was used. The last drill was on 11 July, five weeks before the accident, but none of the crew in the FRC on 25 August had participated in that drill.

When IR1 fell overboard on 25 August, the master did not allocate tasks to the crew using the muster list as a guide. He chose to leave the second mate on the bridge while he lowered the FRC himself, a task which he did not practice at drills.

When the FRC was in the water, the chief mate, who did not usually operate the FRC, started its

engine with the throttle set to run ahead even though the FRC had not yet been released from its hoisting wire. The sudden stop, when the boat's forward movement was arrested by the wire, caused IR2 to be thrown forward in the FRC where he broke his ankle.

While there was a need to respond to the situation very quickly, the hasty response of the crew bordered on panic. In their haste to launch the FRC, the master and crew undertook tasks that they had not regularly practiced. Furthermore, their near panic prevented them from effectively planning or executing their tasks.

Search effort

It is possible that IR1 struck a narrow sponson on the ship's side during his fall overboard or that he was drawn through the propeller once he was in the water. Furthermore, while he could swim, the alcohol that he had consumed would probably have inhibited his ability to swim or stay afloat once he was in the water.

He did not, or could not, swim to either of the lifebuoys that had been thrown into the water immediately after he had fallen overboard. The ship was quickly stopped and then returned to the area where he fell overboard but he could not be found.

Once IR1 was not found near the lifebuoys, a search pattern was established using the MOB position and the available wind and current data with reference to the International Aeronautical and Maritime Search and Rescue Manual.

After a search involving two ships and an aircraft, both lifebuoys were recovered but no sign of the missing seaman was found.

The sea was moderate with a temperature of about 23°C, the air temperature was about 18°C and IR1 was wearing three quarter length pants, a shirt and a woollen hat. He was probably fatigued and had consumed a significant quantity of alcohol during the previous twelve hours.

Medical advice was obtained by RCC during the incident and they established that it was unlikely that the missing man would survive beyond last light on 25 August.

Geosounder's master felt that the area of interest had been searched thoroughly and believed the chances of locating the missing man alive to be

remote. In consultation with RCC, he called off the search at 1835 when it became too dark to continue and diverted the ship to Cairns to disembark and treat the injured integrated rating.

The master's decisions to call off the search and take the injured crew member to Cairns for treatment were reasonable considering the very low probability of finding the missing man alive if the search was resumed on 26 August.

FINDINGS

From the evidence available, the following findings are made with respect to the fatal man overboard accident and the subsequent crew injury on board *Geosounder* and should not be read as apportioning blame or liability to any particular organisation or individual.

Contributing Safety Factors

- While the Geoshipping safety management system included a 'no alcohol' policy, it was not consistently and effectively implemented on board the ship. Consequently, an off-duty integrated rating who was skylarking on deck while under the influence of alcohol fell overboard and was not found. *[Safety issue]*
- The haste of the crew to launch the fast rescue craft to locate the missing man overboard resulted in the master and crew performing tasks that they had not regularly practiced and they did not plan or execute their tasks effectively. Consequently, the chief mate drove the fast rescue craft ahead before it had been released from its hoisting wire. *[Safety issue]*

Other key findings

- The master's decision to call off the search and take the injured crew member to Cairns for treatment was reasonable considering the very low probability of finding the missing man alive.

SAFETY ACTION

The safety issues identified during this investigation are listed in the findings and safety action sections of this report. The Australian Transport Safety Bureau (ATSB) expects that all safety issues identified by the investigation should be addressed by the relevant organisation(s). In addressing those issues, the ATSB prefers to

encourage relevant organisation(s) to proactively initiate safety action, rather than to issue formal safety recommendations or safety advisory notices.

All of the responsible organisations for the safety issues identified during this investigation were given a draft report and invited to provide submissions. As part of that process, each organisation was asked to communicate what safety actions, if any, they had carried out or were planning to carry out in relation to each safety issue relevant to their organisation.

Safety action taken by DOF Subsea and DOF Management

The ATSB has been advised that the following safety actions have been taken by DOF Subsea and DOF Management (formerly Geoshipping) following the loss of a crew member overboard from *Geosounder*.

- The Alcohol and Drug Policy for the vessels managed by DOF Management (formerly Geoshipping) has been amended and communicated to all operating company vessels and personnel onboard and that this policy and the implementation is continuously monitored by company senior management and vessel management (inclusive of vessel masters and officers).
- Appropriate action has been implemented to ensure that Emergency Training & Drills (inclusive of FRC training and drills) are undertaken on a regular basis and inline with schedule requirements and personnel movements.

SUBMISSIONS

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

The final draft of this report was sent to the master, chief mate, second mate, boatswain and IR2 on board *Geosounder*, IR1's next of kin, DOF Subsea Australia, DOF Management (formerly Geoshipping), the Norwegian Maritime

Directorate, the ship's protection and indemnity (P & I) lawyer and the Australian Maritime Safety Authority (AMSA).

Submissions were received from the chief mate and second mate on board *Geosounder*, DOF Subsea Australia, DOF Management, the Norwegian Maritime Directorate, the P & I lawyer and AMSA. Submissions were included and/or the text of the report was amended where appropriate.