Enclosed spaces: When saving a life turns fatal

Enclosed spaces on ships - such as cargo tanks, holds, and chain lockers - are among the most dangerous environments onboard. While much attention is paid to the initial victims of asphyxiation or toxic exposure, a significant and tragic share of fatalities are would-be rescuers: crew members who rush in to save a colleague, only to become victims themselves.

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Concerningly, the majority of multi-fatality incidents in enclosed spaces involve at least one rescuer who perished after entering without proper precautions.

The numbers speak for themselves

Many fatalities involve would-be rescuers - individuals who entered enclosed spaces to save others and became casualties themselves. According to NIOSH, more than 60% of confined space deaths occur among rescuers. IBTA's analysis submitted to the IMO shows that between 2000 and 2024, there were 67 such fatalities on ships - 48 were crew members and 19 were shore workers. Senior officers (masters, chief officers, chief engineers) are disproportionately represented among rescuer fatalities; for example, nearly half of the 23 masters who died in enclosed spaces lost their lives in rescue attempts.

Case study

The vessel concluded discharging Ultra-Low Sulfur Diesel (ULSD) and initiated extensive tank cleaning over six days in preparation for loading Soyabean and Sunflower oil. All tanks were gas-freed, and multiple crew entries were conducted. On the final cleaning day, the Port Slop tank was successfully de-slopped of Annex I wash water. However, the Starboard Slop tank still contained approximately 70 cubic meters of Annex II wash water mixed with a tank cleaning chemical. Over the next week, the vessel then loaded Soyabean and Sunflower oil cargoes into the tanks, except Slop (P & S). Two days after departure from the load port, the crew began pumping out the contents of the slop starboard tank using the Annex II overboard line. When the tank reached stripping level, the Chief Officer instructed the Bosun to open the tank dome and descend to the first platform to hose down the tank. The Chief Officer and Bosun were at the tank dome, while a deck cadet was stationed at the hydrant to operate the fire hose valve.

Upon entering the slop tank, the Bosun collapsed onto the top platform of the slop tank, located 2 meters below the tank entrance. The Chief Officer immediately instructed the deck cadet to retrieve Self-Contained Breathing Apparatus (SCBA) sets. However, before the equipment arrived, the Chief Officer entered the slop tank to rescue the Bosun and also collapsed.

Seeing this, the cadet alerted the bridge. The Third Officer donned the SCBA and descended to the top platform. Thankfully, both the Bosun and the Chief Officer were successfully retrieved within approximately 7 minutes. They received first aid and were transferred to the ship's hospital. The company's doctor was contacted for further medical assistance. For the next 36 hours, both crew members were closely monitored by the onboard crew and the doctor (remotely) until they recovered fully.

Gas readings taken at the top of the platform after the rescue showed normal atmosphere. It is suspected that oxygen levels were lower and LEL higher at the time the Bosun entered the tank, as the hatch had only been opened moments earlier. Toxic gases, particularly lighter-than-air vapors, may also have been present. At the time of the incident, the vessel was approximately 400 nautical miles from the nearest port.

While the investigation is ongoing, preliminary findings have confirmed that no tank atmosphere check was performed, no enclosed space entry permit was issued, and no SCBA or rescue equipment was prepared at the entry point. What is clear is that the initial double collapse was followed by a swift and coordinated response from the remaining crew, ultimately saving two lives.

This case highlights the importance of understanding the human impulse of would-be rescuers to enter without proper safety equipment. Equally important, it demonstrates that a well-executed rescue, grounded in teamwork and adherence to safety protocols can mean the difference between tragedy and survival. Finally, it emphasizes the crew's ability to provide effective medical first aid immediately after the rescue.

Reasons for fatalities of would-be rescuers

There can be multiple reasons behind the deaths of would-be rescuers. Some highlight psychological aspects, such as the "rescuer syndrome," as referred to in InterManager's submission to IMO (III 11/4/4, 2025 [KJ1]), where people feel a compulsive urge to react instantly and instinctively. Research by Pearn and Franklin (2012) describes "rescue altruism" as a blend of:

- Ethos: Driven by the Good Samaritan or Golden Rule ethic.
- Identity: Rescuer identifies with the victim, often due to a perceived duty-of-care.
- Risk perception: Belief that there is a chance of success, even if the risk is high.
- Courage: Personal bravery that often overrides rational risk assessment.

In emergencies, especially when a colleague or subordinate is in peril, this impulse can override training and procedural requirements, resulting in a chain of fatalities as each rescuer succumbs to the same unseen hazard.

There are also other contributing factors behind the fatalities:

• Holding breath: Some rescuers attempt to hold their breath, believing a quick entry is safe, as highlighted in MAIB Safety Bulletin 02/2008.
• Improper equipment: Emergency Escape Breathing Devices (EEBDs), designed for escape only, are sometimes misused for rescue entry, despite clear warnings. There have also been instances where would-be rescuers have entered the space using an air hose.
• Unrealistic drills: Practicing rescue in non-hazardous spaces or without full gear leaves crews unprepared for the realities of a true emergency.
• Misinterpretation of collapse: Would-be rescuers may not realize the initial casualty collapsed from asphyxiation, assuming a slip, trip, or fall instead.
• Delayed or uncoordinated response: Lack of immediate access to rescue equipment or poor coordination can delay effective rescue, reducing survival chances.

What does a successful rescue entail?

A successful enclosed space rescue depends on replacing the impulse to rush in with disciplined, methodical action and strict adherence to emergency procedures. Key requirements include:

• Proper equipment: Only trained personnel equipped with self-contained breathing apparatus (SCBA) should enter the space.
• Rescue equipment ready: Harnesses, lifelines, and communication devices must be available and set up at the entry point before any entry.
• Designated attendant: An attendant should remain outside the space to coordinate and monitor the rescue operation.
• Clear rescue plan: A well-communicated rescue plan with clearly defined roles for all involved is essential.
• Effective communication: Maintain constant communication between rescuers, attendants, and command throughout the operation.
• Realistic drills: Regular, realistic rescue drills ensure the crew can instinctively follow procedures under pressure.
• No impulsive entry: Unplanned or impulsive entry must never be allowed—always pause, assess, and follow the established rescue protocol.

The time the rescue team has is critically dependent on the atmosphere inside the enclosed space, as different gases have varying levels of fatal readings and time-to-effect. For example, when oxygen concentration drops to 6–8% by volume, exposure can be fatal within eight minutes; if oxygen falls below 6%, a person may lapse into a coma within a minute, as highlighted in Singapore's Technical Advisory on Working Safely in Confined Spaces . Therefore, it is strongly recommended that time-based objectives be incorporated into enclosed space entry drills, so that crew members fully understand the urgency.

In the case study mentioned above, several factors contributed to the successful rescue, as per the vessel's Managers. The casualties were located on the top platform, which significantly eased the complexity of the physical rescue compared to a recovery from a lower level in the tank. Timely intervention was also facilitated by the slop tank's proximity to the SCBA storage locker, minimizing retrieval time. The swift donning of the SCBA by the Third Officer under stress demonstrated effective training, and the medical oversight provided immediately post-rescue, in conjunction with remote consultation from the company-appointed doctor ashore, ensured proper care and full recovery.

Key take-aways

Incidents in enclosed spaces remain among the most preventable causes of fatalities at sea, yet they persist, often claiming the lives of well-intentioned rescuers. This case study and supporting data underscore a critical truth: safety must take precedence over instinct. Breaking the cycle of impulsive rescue attempts requires unwavering adherence to established procedures, proper use of equipment, and realistic, scenario-based training.

The challenge is twofold: ensuring that drills and training are robust and consistently implemented, while addressing the human factors that drive individuals to act impulsively, sometimes with tragic consequences. Equally important is fostering an organisational culture that truly empowers people to pause, speak up, and prioritise safety over urgency.

Drills and briefings should explicitly acknowledge the natural rescue instinct and rehearse resisting it. In a real emergency, the first reaction must be to follow the plan and not rush in, so that every crew member has the best chance of returning home safe.

References

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• impulse to rescue