

Drowning and Suffocation Workplace Fatal Injuries in 1H2026

In the first half of 2026, four workers drowned in two separate workplace accidents, and one worker likely suffocated after entering a confined space onboard a marine vessel at a shipyard.

To ensure workers' safety, the WSH Council calls on all companies carrying out vessel operations and confined space work to review their risk assessments and safe work procedures, and put in place control measures to prevent workers from drowning, and effectively manage confined space entry risks.

Worker died after falling overboard

On 11 March 2026, a maintenance worker boarded a supply vessel to repair an engine pump. After completing the repairs, he stood on the aft deck of the vessel and was waiting for a bumboat to take him back to shore when he fell overboard. The vessel crew threw him a life buoy and two of them jumped into the water to rescue him. He was retrieved unconscious and died shortly after arriving at the hospital.

It was not raining, the sea was calm, and the worker was not wearing a life jacket at the time of the accident.

Figure 1: Scene of the accident.



Worker found unconscious in pipe

On 6 April 2026, a worker was tasked to arc weld a 10 cm diameter vertical pipe to a 70 cm diameter horizontal pipe onboard a marine vessel at a shipyard. He was found lying unconscious inside the 70 cm pipe, about 1 metre from the pipe opening. He was subsequently extricated and pronounced dead at the scene.

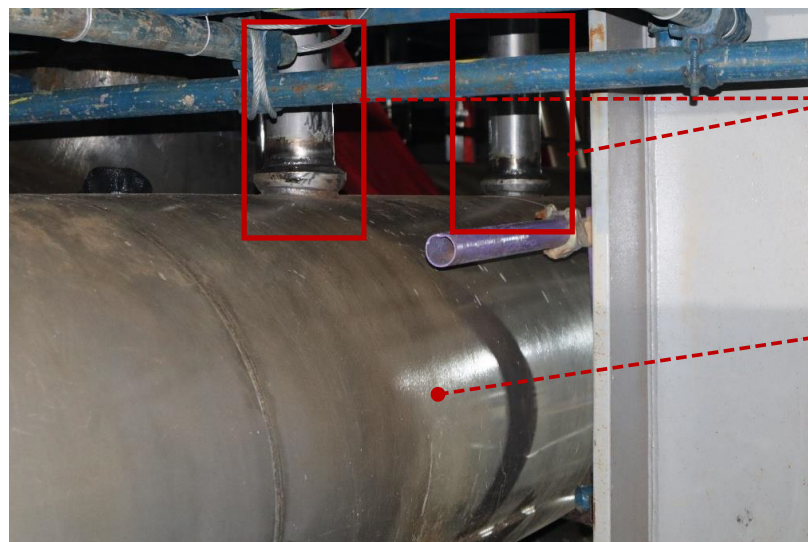
The worker was likely overcome by argon gas (an inert gas used to improve weld quality) when he entered the 70 cm pipe to retrieve a foam damper after completing the welding work. There were no warning signs to alert workers that the pipe was a confined space.

Figure 2: Scene of the accident.



The worker was found inside this 70 cm diameter horizontal pipe

Figure 3: Welding setup.



10 cm diameter vertical pipes

70 cm diameter horizontal pipe

Figure 4: The foam damper used at the bottom end of the 10 cm pipe.



Workers drowned after vessel collision

On 12 June 2026, a workboat carrying three workers collided with a landing craft at sea. The workboat subsequently sank and all three workers drowned.

Figure 5: The landing craft involved in the accident.



Figure 6: Video still of the workboat that sank following the collision.



What companies should do

Companies should assess and ensure that their WSH management system includes the following measures or checks:

- **Worker competency and training:** Deploy only vessel masters and operators who are trained, licensed and familiar with the local operating conditions, navigation rules, collision-avoidance techniques, and emergency response procedures. For specialised welding works involving inert gases and confined spaces, deploy only competent workers who are trained to carry out the specialised work and have the relevant certifications (e.g. Workforce Skills Qualifications (WSQ) Perform Work in Confined Space Operation).
- **Safety briefing and work supervision:** Brief workers on the site-specific workplace hazards and the control measures in place before work begins, and provide close supervision, especially for workers who are new to the worksite, vessel or assigned tasks. Provide onsite supervision to ensure the work is carried out safely and according to the safe work procedures.
- **Personal protective equipment (PPE):** Ensure workers are provided with suitable PPE for their work activities and are trained on its proper use. PPE should be regularly inspected, maintained and kept in good working condition.

Provide workers onboard vessels with suitable slip-resistant footwear. Where there is a risk of falling into water, provide workers with suitable life jackets.

For confined space work, ensure rescue personnel are equipped with the necessary PPE (e.g. suitable breathing apparatus) and rescue equipment (e.g. explosion-proof lighting, full body harness with retrieval line and mechanical winch) before entry is allowed.

- **Emergency response plan (ERP):** Establish and implement an ERP for foreseeable emergencies, including man-overboard, vessel collision or sinking, and confined space incidents. Train workers on the ERP and conduct regular emergency drills to ensure quick and effective response.

For vessel operations, ensure first aid and emergency response equipment are readily accessible on deck, with at least one crew member trained in first aid, including cardiopulmonary resuscitation. Equip vessels, where applicable, with suitable rescue equipment such as a life raft (where possible) or rescue dinghy, flotation devices with lifelines, rescue poles, beacons for location marking, and distress signalling devices (e.g. flares).

If a vessel is about to sink, instruct all onboard to put on/secure their life jackets, make a distress call over the communications equipment, prepare the life raft, activate the position-indicating beacon(s) and prepare to abandon ship.

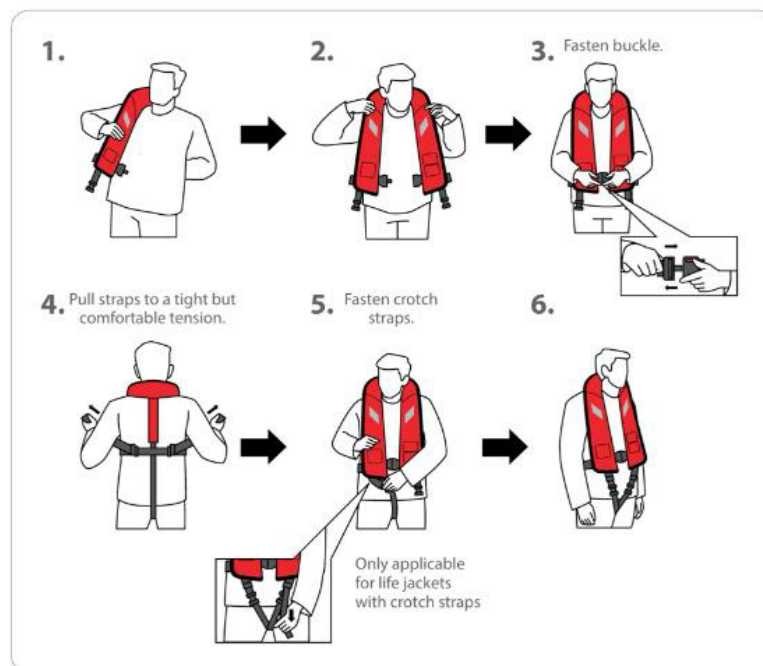
Specific recommendations for working onboard vessels and inside or near confined spaces

Work onboard vessels

Marine traffic operations involve in dynamic and unpredictable environments. Workers deployed to work onboard vessels or near water are also exposed to the risk of falling overboard. Companies deploying marine vessels in Singapore waters should review their risk assessments and strengthen the control measures in place to safeguard workers onboard vessels and at sea.

- **Monitor the weather:** Tune in to Maritime Port Authority's maritime safety information broadcast for the weather bulletin and navigational alerts to stay informed of changing environmental conditions. Do not proceed with boat transfers during unfavourable weather or tidal conditions, extensive vessel/boat movement, if anyone feels unwell or if it feels unsafe to proceed.
- **Deck safety and safe disembarkation:** Ensure vessel decks are fitted with slip-resistant flooring that is flat, even and in good condition. Instruct workers awaiting boat transfer to remain in the designated safe area(s) on deck. These areas should be within the vessel operator's line of sight, clearly marked, free from trip hazards, and away from the edge of the deck. To reduce the risk of falling overboard, vessel owners/operators may consider installing guardrails along the edge of the decking except at designated access points for embarkation/disembarkation. For added safety, selfclosing safety gates may also be installed at these access points. Workers should only move to these access points when embarking/disembarking.
- **Life jacket:** Equip each worker with a suitable life jacket. In general, life jackets should meet ISO 12402: 2020 standards with a minimum performance level of 100 for sheltered¹ or calm waters and 150 for non-sheltered, offshore or rough waters. Ensure the life jacket issued is of the correct size for the worker, worn properly and securely fastened.

Figure 7: Typical steps for donning an inflatable life jacket.



If inflatable life jackets are used, they must be regularly inspected and serviced at authorised service stations according to the manufacturer's maintenance schedule to ensure their reliability and effectiveness during emergencies.

Life jackets significantly improve one's chances of survival following a fall into water or vessel sinking.

¹ With reference to ISO 12402: 2020, sheltered water means water with protection from significant breaking waves, current, or strong winds, where the possibility of being blown or carried away from shore or a place of safety is minimal.

- **Regular vessel maintenance:** Establish a preventive maintenance regime for the vessel's critical equipment (e.g. engine, steering and propulsion equipment, navigation and communication systems). Inspect and test the equipment to ensure they are in good working condition and seaworthy before deployment.
- **Safe vessel navigation:** Vessel operators should navigate at a safe speed appropriate to the prevailing weather, visibility, sea and traffic conditions, and maintain a proper lookout for vessels, obstacles and other hazards along the travel path.
- **Collision avoidance plan:** Establish and implement a collision avoidance plan comprising operating procedures and safety protocols to prevent collisions with other vessels, geographic hazards or floating objects.

The collision avoidance plan should include but not limited to:

- Collision risk assessments;
 - Actions and manoeuvres once the risk of collision is confirmed; and
 - Communication and signalling protocols including manoeuvring and warning signals using whistle, ship horns and/or lights.
- **Fatigue management:** Implement a work-rest regime for workers to minimise fatigue. Monitor their working hours and ensure that they have adequate rest before deployment out to sea.
 - **Use of technology:** Consider equipping vessels with key functional navigation, collision-avoidance and communications equipment that pinpoints the location of nearby vessels, facilitate early collision detection, and allow communication between vessels.

Possible technology includes:

- Radar systems for detecting nearby vessels;
- Automatic identification system (AIS) to display the location, speed, and heading of other AIS-equipped vessels in the area; and
- Marine very high frequency radio for voice communication between vessels.

For more information, refer to the WSH (Risk Management) Regulations, WSH (General Provisions) Regulation 23(11), Maritime and Port Authority of Singapore (Port) Regulations, Maritime and Port Authority of Singapore's [Guidelines for Safe Transfer of Persons Between Vessels at Anchorages](#), International Regulations for Preventing Collisions at Sea (COLREGs), International Code of Signals (INTERCO), The Baltic and International Maritime Council's [Safe Passage in The Straits of Malacca and Singapore](#), Maritime and Port Authority of Singapore's [Safety of Harbour and Pleasure Craft Operating in Port](#), and ISO 12402: 2020 Personal Flotation Devices.

Other relevant resources include the WSH Council's [WSH Guidelines on Personal Flotation Devices - Life Jackets](#), [Guide to WSH for Service Providers on Safe Working on Ships at Anchorages](#), [Case Studies on Working In and Around Water](#), Video on [Safe Boarding of Vessels](#), WSH poster on [Safety Actions to prevent Slips, Trips and Falls in the Marine Industry](#), [6 Basic WSH Rules for Use of Life Jackets](#) and WSH articles on [Proper Selection and Use of Life Jackets can Save Lives](#) and [Preparing for Adverse Weather Events](#).

Welding work involving confined space entry

Pipelines temporarily filled with inert gas can become confined spaces, even if they have openings, and are not meant for human entry. Companies carrying out pipe welding works involving the use of inert gas should review their risk assessments and put in place the necessary control measures to manage confined space entry risks.

- **Confined space identification and labelling:** Conduct a site walkabout to identify all confined spaces, including areas that may become confined spaces during work. Post notices or warning signs at entry points, install physical barriers, and close/lock openings to prevent unauthorised entry.

Under the WSH (Confined Spaces) Regulations 2009,

A “**confined space**” is any chamber, tank, manhole, vat, silo, pit, pipe, flue or other enclosed space, in which:

- a) Dangerous gases, vapours or fumes are liable to be present to such an extent as to involve a risk of fire or explosion, or persons being overcome thereby;
- b) Supply of air is inadequate, or is likely to be reduced to be inadequate, for sustaining life; or
- c) There is a risk of engulfment by material.

“**Entry**” means the ingress by a person into a confined space which occurs when the person’s head passes through an opening into the confined space.

- **Safe entry into confined space:** Comply with the requirements specified under the WSH (Confined Spaces) Regulations 2009. This includes but not limited to:
 - **Permit-to-work (PTW) system:** Establish and implement a PTW system for confined space entry, which includes but not limited to:
 - Submission by the supervisor of the person entering the confined space;
 - Thorough evaluation by a competent confined space safety assessor prior to entry;
 - Approval by an authorised manager;
 - Issuance of the confined space entry permit;
 - Display of the permit at the entrance to the confined space; and
 - Revocation of the permit once the work is completed or if the confined space poses a risk to workers.
 - **Confined space entry procedures:** Establish and implement procedures that include:
 - **Mechanical ventilation (**ventilate before entry**):** Carry out push-pull ventilation to introduce fresh air and remove/reduce the concentration of flammable or toxic gases/vapours.
 - **Initial atmosphere testing (**test before entry**):** Appoint a confined space safety assessor to conduct gas testing and verify that the oxygen level and concentration of flammable and toxic gases/vapours are within acceptable limits before entry is allowed.
 - **Periodic atmosphere testing:** Conduct regular testing by a confined space safety assessor to ensure the atmosphere remains safe throughout the work.
 - **Continuous gas monitoring:** Equip at least one worker entering the confined space with a handheld or body-worn multi-gas detector to continuously monitor atmospheric conditions and alert workers if it becomes unsafe.

- **Purge dam² selection:** Use suitable purge dams (e.g. inflatable dampers with pull-cords) to prevent inert gas leakage and allow its removal without entering the pipe. If foam dampers without pull-cords are used, provide workers with extended retrieval tools (e.g. grabbers) for safe removal from outside the pipe opening.
- **Safe work procedures (SWP) for welding work:** Establish and implement SWP covering welding work with inert gas, purge dam methods, and any confined space entry upon welding work completion. Ensure all workers are briefed and understand the SWP, possible hazards onsite, steps to carry out work safely, and control measures that must be checked before starting work.

The use of inert gases (e.g. argon) displaces oxygen in the air, creating an oxygen-deficient atmosphere that can lead to rapid unconsciousness and death.

Workers should never insert their head or upper body into a confined space with unknown atmosphere.

- **Supervise confined space work:** Provide on-site supervision to ensure that the SWP are strictly followed. Authorise supervisors to stop the work immediately if:
 - The worksite has the potential to become a confined space in the course of work but was not identified as one;
 - No permit was issued for the confined space entry;
 - Ventilation is inadequate;
 - No initial atmosphere test was carried out; or
 - Unsafe conditions or an emergency arises while the work is in progress.

The WSH (Confined Spaces) Regulations 2009 requires a confined space attendant to be appointed to monitor worker(s) entering a confined space, maintain regular contact with the workers inside, and activate emergency response as necessary.

Companies may refer to the [Sample Checklist for Confined Space Work](#) when developing a site-specific confined space entry and rescue plan.

For more information, refer to the WSH (Confined Spaces) Regulations 2009, WSH (General Provisions) Regulations, WSH (Shipbuilding and Ship-Repairing) Regulations 2008, SS 568: 2011 Code of Practice for Confined Space, SS 510: 2017 Code of Practice for Safety in Welding, Cutting and Other Operations involving the Use of Heat, and the WSH Council's [Code of Practice on WSH Risk Management](#), and [Technical Advisory on Working Safely in Confined Spaces](#).

Other relevant WSH resources include: [Confined Space Safety Guidebook for Supervisors and Workers](#), [6 Basic Rules for Confined Space Entry](#), [WSH Insights on Safe Entry Into Confined Space](#), [WSH Advisory for Confined Space Workplace Fatal Injuries in 2H2024](#), and [Incident Sharing – Dangers of Confined Spaces in Chemical Industries](#).

Under the WSH Act, first-time corporate offenders may be sentenced to the maximum fine of \$500,000 whilst individuals can either be sentenced to the maximum fine of \$200,000 and/or an imprisonment not exceeding 2 years. Read more on the [WSH Act penalties](#).

² Purge dams are temporary barriers used in pipe welding to isolate a specific section of pipe to enable filling with an inert gas to create an oxygen free environment to enhance the weld quality during gas shielded welding works.

Information on the accidents is accurate as of time of publication. This may be subject to change as investigations are still ongoing. Please also note that the recommendations provided here are not exhaustive and are meant to enhance workplace safety and health so that a recurrence may be prevented. The information and recommendations provided are not to be construed as implying liability on any party nor should it be taken to encapsulate all the responsibilities and obligations under the law.

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