

Hydrogen sulphide gas exposure fact sheet

Transport for NSW - Maritime

May 2021

Background

This safety alert shares important information about the production of hydrogen sulphide (H₂S) gas on vessels, and the danger this gas presents to the health and safety of people.

Hydrogen sulphide is a gas that is commonly generated within sewage holding tanks on board a vessel. It is a toxic, flammable, colourless gas that is heavier than air and smells like rotten eggs.

Breathing in high levels of hydrogen sulphide gas can cause loss of consciousness within as little as one or two breaths and loss of life within minutes.

Risks

Hydrogen sulphide collects in confined spaces and poorly ventilated or enclosed areas that contain a sewage holding tank or other parts of sewage systems. If a system is damaged, malfunctioning or connections are not tight enough, and organic matter or sludges are disturbed, gas may escape. For example when adding or discharging effluent material into a compromised system.

Sewage holding tanks on vessels that also have galley waste directed to them are particularly prone to forming a greasy sludge film that floats to the surface of the tank, and this further promotes the production of hydrogen sulphide. Blockage of ventilation components also increases the risks of hydrogen sulphide back-venting, and escaping into toilet and other confined spaces via the sewerage pipe network.

Prolonged exposure to even low concentrations of hydrogen sulphide affects the sense of smell (olfactory desensitisation), so the 'rotten egg' odour can no longer be noticed. Higher concentrations will dull the sense of smell instantly, and often compromise a person's ability to exit an affected area.

Exposure to lower concentrations (5 to 30 ppm) may cause eye irritation, headaches, and dizziness. Higher concentrations can cause blurred vision, neurological failure and death from respiratory failure. At extremely high concentration levels, death can be immediate.

Actions to minimise the risks of hydrogen sulphide gas

- Identify any confined spaces or hazardous areas such as voids with holding tanks, toilets without ventilation, vents terminating in enclosed spaces which may release, produce or contain hydrogen sulphide gas.
- Thoroughly ventilate confined spaces before entering these spaces.
- Consider installing a gas monitor to ensure that the dangerous gas levels are low in hazardous areas.
- Regularly pump out sewage holding tanks.
- Regularly and thoroughly clean sewage holding tanks to remove the build-up of organic matter.
- Ensure ventilation to all toilet cubicles is sufficient to provide a safe environment for use.
- Ensure continuous flow water leaks which result in an increase in waste fluid levels in the holding tank are promptly repaired by a qualified person.
- Regardless of vessel type or area of operation, ensure that a qualified person/s install or modify the sanitary system on vessels.
- Regularly and thoroughly maintain sewage system components and sewage treatment systems in accordance with the manufacturer's recommendations.
- Commercial vessels are considered a work place and should have procedures in place for entering enclosed spaces, risk assessment and providing training to personnel on hazards, control measures, personal protective equipment, entry permits and emergency procedures. For more details visit the [NSW Safe Work website](#).

Vessel owners and operators, vessel crew, and others associated with the operation or maintenance and repairs of vessels should understand the correct and compliant procedures for sewage systems on board. Protocols should be incorporated into operational procedures, training, awareness and hydrogen sulphide gas risk minimisation efforts.

Additional Information

- [SafeWork NSW Safety Alert](#)
- [OTSI Ferry Safety Alert](#)
- [SafeWork NSW Hazardous Gas video](#)
- [National Pollutant Inventory](#)

For queries and further information on vessel sewage systems contact our Technical and Environmental Compliance team at TEC@transport.nsw.gov.au.