

FIRE FIGHTING SUPPORT EMERGENCY ACTION CARD



Golden Rule

Don't Rush In



HAZARDS OF SPECIFIC CARGOS AND FUELS

Liquified Gases (LNG, LPG, Hydrogen)

Main Hazards

- ▶ Vapour Cloud: An unignited release forms a vapour cloud.
 - LNG vapour starts dense but gets lighter than air as it warms.
 - LPG vapour is heavier than air and stays low.
 - Hydrogen is extremely light and disperses rapidly upwards.
- ▶ Flammability: All are highly flammable. Hydrogen requires very low energy to ignite and burns with a nearly invisible flame.
- ▶ BLEVE: A Boiling Liquid Expanding Vapour Explosion can occur if a pressurized container is heated by an external fire, causing a catastrophic rupture.
- ▶ Cryogenic Temperatures: Extreme cold from LNG (-162°C) or liquid hydrogen can cause embrittlement fracturing standard steel structures.

Response

- ▶ Extensive boundary cooling of the surrounding area.

Toxic Fuels (Ammonia & Methanol)

Methanol

- ▶ Toxic: Harmful through inhalation, ingestion, and skin absorption.
- ▶ Invisible Flame: Burns with a nearly invisible blue flame and little smoke.
- ▶ Firefighting: AFFF is recommended. Methanol can burn when highly diluted, only use water for boundary cooling.

Ammonia:

- ▶ HIGHLY TOXIC: Vapours are toxic to humans and marine life. Vapour is denser than air and will sink and pool on deck or water surface.
- ▶ Difficult to ignite: Primary risk is toxicity, not the fire.
- ▶ Firefighting: Water is the most effective method to extinguish, however applying large quantities of water to a liquid ammonia pool will increase the evaporation rate, making the fire larger.

Safety First!

Specialist PPE, such as chemical suits with SCBA, and gas detectors are essential. Stay upwind. Do not enter a hazardous vapour zone without them.

Lithium-Ion Batteries

Key Hazards:

- ▶ Vapour Cloud Explosion: Thermal runaway generates large volumes of flammable and toxic gases that can build to their lower explosive limit and explode within a space.
- ▶ Extremely Difficult to Extinguish: The fire is a chemical chain reaction. The most effective known method is often prolonged boundary cooling until the fire burns itself out.
- ▶ Reignition Risk: Batteries can reignite unexpectedly, even days after the initial fire appears to be out, due to residual chemical energy.

Response:

Maintain a safe distance due to explosion risk. Stay upwind. Apply continuous, prolonged boundary cooling with amounts of water, be mindful of the casualty's stability.

POINTS TO REMEMBER

Do we have a duty to provide assistance? Are we insured?

Know the difference between **Rescue & Salvage** – it has major implications for our company.

Saving Life (Rescue):

- ▶ Legal Duty: Under Regulation V/33 of SOLAS Convention, a master is legally bound to render assistance to any person in danger of being lost at sea, so long as it can be done without serious danger to their own vessel and crew.
- ▶ Insurance: Assisting to save life is often covered under a tug's standard P&I insurance.

Saving Property & Environment (Salvage):

- ▶ Voluntary Act: Engaging to protect property (the vessel, its cargo) or the environment is considered a salvage operation. This is a voluntary act, not a pre-existing legal duty.
- ▶ Insurance: This requires specialist insurance cover for professional salvage activity. Standard P&I does not cover this.
- ▶ Payment: Remuneration is typically based on a "no cure, no pay" salvage claim, often under a contract like the Lloyd's Open Form (LOF).

STOP & THINK

- ▶ Do we have all available information (Knowns & Unknowns):
 - a. Vessel position & navigational status?
 - b. Type of fire / cargo on-board?
 - c. Status and location of ship's crew?
- ▶ Can we provide assistance without risking our safety?
- ▶ Do we know the risks to our safety, the environment, our vessel, and how to mitigate these?
- ▶ Do we have sufficient crew / resources to provide assistance?
- ▶ Ensure shore management are aware of the request.



KEY POINTS

- ▶ **Remember:** The safety and recovery of people in the water takes precedence.
- ▶ Stay alert for toxic smoke or fumes entering the accommodation.
- ▶ **Primary Tactic:** Boundary Cooling to prevent fire spread.
- ▶ **Critical Risk:** Water Ingress & Stability
- ▶ Avoid overflowing the casualty vessel. Uncontrolled water application can be more dangerous than the fire – free surface effect & structural overload.
- ▶ Maintain close communication with the ship's crew about stability and drainage.
- ▶ **Remember:** Tug Master's Authority - while taking direction, the master remains in charge and responsible for our vessel and crew safety at all times.

PREPARE

We Have:

- ▶ Responded to the request to provide assistance.
- ▶ Requested and received an initial firefighting plan (offensive vs. defensive). This "living plan" **will** change.
 - Determined approach direction considering wind direction, debris etc.
 - Ensured we have an exit route from the casualty site.
- ▶ Conducted a crew briefing, assigned duties, and agreed our operational & safety limits.
- ▶ Started detailed record keeping.
- ▶ Tested / proven vessel FiFi equipment including drenching system and closed relevant vents to prevent fumes entering the accommodation.
- ▶ Readied SCBA sets / EEBDs on the bridge.
- ▶ Prepared first aid equipment and area on-board to accommodate casualties.
- ▶ Rigged personnel recovery equipment including throwing lines.

OPERATOR ACTIONS

We Will:

- ▶ Conduct a hot debrief to retain as much information as possible, recording what went well and what could be improved.
- ▶ Arrange debrief with relevant emergency services for lessons learned and improvements.
- ▶ Return firefighting systems to readiness.
- ▶ Inspect your vessel for damage.
- ▶ Ensure we have a detailed log of events, preserving pictures, CCTV, VHF recordings etc.
- ▶ Check your vessel for any damage.

ON SCENE

We Will:

- ▶ Not rush in and reassess the situation.
- ▶ Determine who's in charge
 - Contact the on-scene commander (OSC) or assume the role of OSC if first on scene.
- ▶ Confirm:
 - a. type of fire (cargo, hydrocarbon, alternative fuel, etc.)
 - b. action required – personnel recovery, boundary cooling, extinguishing or containment.
 - c. if foam is required?
 - Water cools, a hydrocarbon fire requires foam to extinguish.
- ▶ Ensure our tug maintains upwind position for maximum monitor reach and safety from fumes.
- ▶ Start monitors in spray mode with nozzles facing away from the incident and activate the tug's drenching system.
- ▶ Monitor our position considering navigational hazards / other assisting vessels.
- ▶ Ensure exit routes from casualty site remain clear.
- ▶ Continually assess, remember our agreed limits and be prepared to withdraw.
- ▶ Continually log / gather evidence – pictures, videos etc.

POST INCIDENT MANAGEMENT

- ▶ Operators may wish to incorporate or integrate this content into their Safety Management System.
- ▶ The use of Checklists may be opportune.
- ▶ Those involved in an incident may have been exposed to a Potentially Traumatic Event (PTE). HM Coastguard has established a Trauma Risk Management (TRIM) service to provide support and guidance.
- ▶ Post Incident: Counselling persons involved in firefighting or those recovered from the scene