# Mariners' Alerting and Reporting Scheme

MARS Report No 353 March 2022

MARS 202208

## Medical mayhem

➔ On a vessel on an extended anchor stay in an isolated port, a crew member began suffering from severe abdominal pain. It soon became evident that the crew member would require professional attention, and it was decided to transport him ashore. To comply with local regulations a shore pass was needed so the Master had to 'off-sign' the victim first. Once this was done, several hours passed before the victim could be picked up by launch. The victim could not lie down on the launch due to lack of space, while the pain was becoming ever more intense.

Once ashore, no ambulances were available so the victim was transported to the nearest hospital, which was about a one hour trip, in a non-specialised vehicle. At the hospital, the victim was diagnosed with appendicitis but an operation was not considered appropriate at the time. Some hours later the victim's pain became unbearable. The fear of perforated appendicitis triggered the call for a surgeon and, several hours later, the operation was performed; a perforated appendix was remedied.

Communication with the hospital was problematic since the victim did not speak the local language and the hospital personnel were not conversant in English. The company did not arrange for an interpreter. On the second day, the victim had to leave the hospital and was taken to an unhygienic, mouldy room to recover. Only after lengthy and strong protest did the victim get access to a clean room in a nearby villa rented by the company. However, medical aid was not available.

Eventually, the victim managed to be repatriated – although on a flight with lengthy stop-overs and without being able to lie down, which was contrary to the received medical advice. Once home, a second operation was urgently needed.

### Lessons learned

- A failure to plan is planning to fail.

Some due considerations from this case study:

– The Master needs an emergency plan which includes instructions for landing victims for hospital/medical treatment. This procedure may be generic, but should include additional guidelines for specific trading areas or projects where necessary.
– The Master should be aware of port requirements for shore passes and signing off procedures in case of emergency (especially in times of pandemic such as Covid where additional hurdles may be involved).
– The location of the nearest hospital should be known, as well as the quality and reputation of the hospital.
– Depending on the area where the vessel is operating, an interpreter should be considered should crew be sent ashore for care.
– Crew members sent ashore for medical treatment should always be accompanied by someone who is able to provide help/assistance.

MARS 202209

## Fumigation fatality

**As edited from official BMA (Bahamas) report published 19 November 2020**

➔ A small general cargo vessel with seven crew berthed to load a cargo of corn in bulk. Loading commenced after preparation and cleaning of the hold. The gas tight integrity of the hold was not tested before loading, even though it was intended to undertake in-transit fumigation after loading.

Fumigation specialists arrived at the vessel once loading was complete. They verbally confirmed with the Master that the hold was suitable for fumigation. Several bags of aluminium phosphide fumigant were then placed in the hold. The plan was to provide a dose of 1g of active ingredient per cubic metre of cargo. The hatches were closed, and the Master was given a briefing document pack and gas detection equipment for testing for the presence of the fumigant inside the accommodation and engine room. The Chief Officer was given training on the use of the gas detection equipment. According to these instructions, tests were to be conducted every eight hours.

The vessel departed the next morning with the favourable tide. At 0800, the Chief Officer carried out an initial check for the presence of the fumigant. He tested two locations in the accommodation and one in the engine room. These checks were repeated at 2000 that evening and at 0800 the following day. During this period, the weather deteriorated and the Master adjusted the passage plan to reduce the motion of the vessel. At approximately 1030 on the second day out of port, a significant wave caused flooding in the galley and store through the ventilation trunking. The accommodation ventilation flaps were shut and the ventilation system stopped.

After lunch, the crew who were not working retired to their cabins. By 1245, several of the crew were experiencing headaches, fatigue and severe nausea. This was attributed by various members of the crew to either seasickness, a reaction to the food eaten at lunch, or the presence of exhaust gas in the accommodation. None were aware they were actually suffering from fumigation poisoning.

With the exception of the Chief Engineer, who went to the engine room, the affected crew either remained in their cabins, or went to the bridge or on to the boat deck to get fresh air. At about 1800 that day, when the Master became aware that at least three of the crew were unwell, the possibility of fumigation poisoning was raised.

The atmosphere in the accommodation was re-tested and the presence of deadly fumigation gas was confirmed. Local authorities were immediately informed of the situation and assistance was requested. The crew were then moved to the ship's office and Master's cabin, where windows could be opened to increase the flow of fresh air. Some time before 1900, one crew member returned to his cabin unnoticed.

About one hour later, a rescue helicopter arrived at the vessel. A winchman was lowered on to the deck, but poor weather conditions and a technical issue with the helicopter meant the helicopter had to return to base without the winchman or affected crew. The vessel re-routed to the closest port.

By now, three members of the crew were in a serious condition and the crew member who had returned to his cabin was found there unresponsive.

An hour later, a second helicopter arrived with a medical team. They were able to stabilise the three crew, who were evacuated by boat when the vessel approached the port pilot station. They eventually recovered in hospital. The unresponsive crew member was declared deceased.

The official investigation found, among other things, that:

- No consideration was given to the potential knock-on effects of closing the ventilation flaps of the accommodation, thus stopping the ventilation, or the additional risk posed by the fumigated cargo.
- By the time the vessel accommodation's forced ventilation was stopped, there was a positive pressure of fumigation gas in the hold. Stopping the ventilation and closing the ventilation flaps resulted in positive pressure being lost in the accommodation, allowing the fumigant to enter the accommodation via the sanitary ventilation system and, to a lesser extent, other entry points.
- At least two members of the seven person crew (28%) were not present for the Chief Officer's fumigation briefing. It would appear that the briefing did not highlight the risks of the operation or symptoms of poisoning enough to alert the crew when taken ill, even for those that were present.
- The periodic monitoring of the accommodation and engine room atmosphere was not conducted at the required eight hour frequency and did not detect the fumigant in time to avert lethal levels of exposure. Additionally, the fumigant's 'carbide additive' did not provide sufficient olfactory warning (smell) to indicate the presence of the fumigant.

## Lessons learned

- The suitability of a vessel for fumigation is a critical factor and could mean the difference between life or death. This problem has been seen in the past, as in MARS report 200880, and in particular in the following MARS report 202210. Companies must have adequate procedures in place to assess the suitability of a vessel to carry fumigated cargoes.
- The BMA report on which this MARS report is based lists seven other instances where fumigation gases have caused fatalities or very serious illness to crew (2008-2020). The common factors from these occurrences were:
  - Crew unaware of effects of exposure to fumigant gas.
  - Symptoms were confused with food poisoning or seasickness.
  - Ineffective or inadequate periodic testing regime.
  - Lack of effective physical barriers between fumigated cargo space and accommodation.
- When in-transit fumigation of cargo is planned, extreme care should be taken to assess the integrity of ventilation trunks, shared bulkheads, duct keels and electrical conduits that might allow passage of gas into accommodation or working areas.
- Masters and crew of vessels used for in-transit fumigation must be aware of the potential impacts of changing ventilation arrangements such as adjusting closing devices or flap settings, air conditioning and closed loop ventilation; this could create a vacuum which draws in the fumigant gas.
- Periodic atmosphere monitoring is not as effective as continuous monitoring.
- All crew must be fully aware of the risks and mitigation measures required to carry fumigated cargo safely. All should be fully briefed on the particulars of the smell of the fumigant, effects of poisoning and actions to take if exposed.

**MARS 202210**

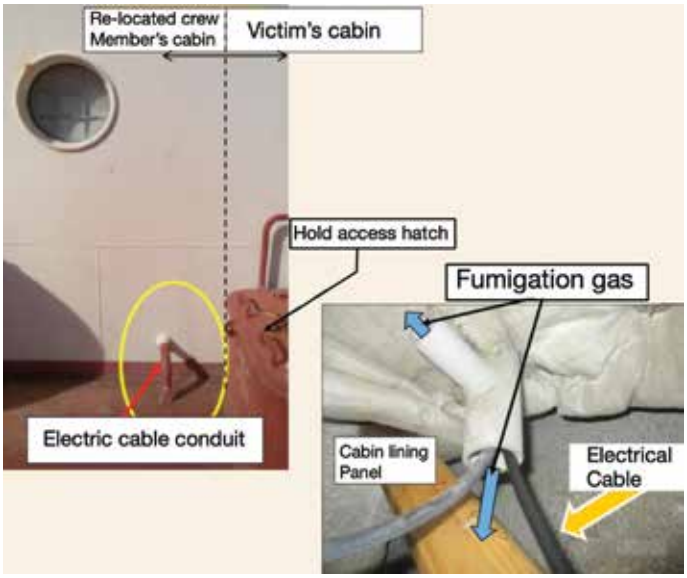
# In-transit fumigation fatality

**As edited from official MAISSPB (Hong Kong/SAR) report published 2019**

➔ A handy-sized bulk carrier was loaded with wheat, and the cargo was fumigated after completion of loading. When the fumigation procedure was undertaken, the hatch covers, ventilators and access hatches to all five cargo holds were sealed. The vessel then departed for a trans-oceanic voyage. The crew had been briefed on the dangers of fumigation gas and the Master told the crew to stay alert for the smell of garlic or decaying fish as this scent had been added to the gas to allow easy detection.

During the first three days of the voyage, phosphine gas readings were taken at regular intervals at the upper deck accommodation and the forecastle deck. All readings were zero ppm. On the fourth day, the gas test results showed that the accommodation on upper deck contained 0.1 ppm of phosphine gas. (According to best practices, an eight-hour average respiratory exposure to phosphine gas should not exceed 0.3 ppm and a short-term exposure should not exceed 1ppm.) On the same day, a crew member remarked that he had noticed a bad odour inside his cabin. A test in the cabin showed no phosphine gas but the crew member was relocated to another cabin.

The next day, a phosphine gas reading of 2 ppm was measured at the upper deck alleyway. The Master called muster stations and instructed all crew to evacuate their cabins at once. The engine cadet did not appear at muster, so two crew went to his cabin where he was found in a state of partial paralysis. The victim was taken outside for care. A phosphine gas reading of 9 ppm was measured in his cabin, which was



next to the cabin of the crew member who had been relocated the previous day.

Over the next hour, the victim's vital signs deteriorated. A request for radio medical advice was sent and cardio-pulmonary resuscitation was carried out, but the crew were unable to revive the victim. His body was brought ashore at a port of refuge two days later.

The official investigation found, among other things, that a permanent access light for the aft access ladder of No. 5 cargo hold had been installed during construction. A conduit was used to run the electric cable between the accommodation and No. 5 cargo hold. The conduit ends were not sealed, contrary to best practices and classification rules. This defect allowed the phosphine gas to infiltrate the accommodation area and enter the crew cabins.

### Lessons learned

- As in the previous report, MARS 202209, the suitability of a vessel for fumigation is a critical factor and could mean the difference between life or death. In this case a 'man-made' defect rendered the vessel unsuitable for fumigation.
- Deadly fumigation gases can take several days to infiltrate accommodation areas, even when a clear passage exists, as in this case. Continuous or very frequent testing is the best defence against this danger.

**MARS 202211**

## Gantry crane improvisation leads to one fatality

**As edited from official report of the MAAIC (Cyprus) 34E/2021**

➔ A small cargo vessel with eight crew on board had berthed in port and was carrying out deck maintenance. The vessel, a single hatch ship, had one hold equipped with 10 pontoon hatch covers that were moved using a hydraulic gantry crane running on rails. The gantry crane operator's platform was located on top of the gantry at the starboard side.

The planned maintenance for the day was to change the rubber gaskets for hatch cover number 8. To accomplish this, hatch cover 8 was lifted and placed onto hatch covers 9 and 10. To keep the hatch cover stable in its temporary position and take some of the load, wooden stanchions were improvised under part of the hatch. Two deck crew were to place the stanchions beneath the hatch cover before changing the gasket. The gantry crane operator could not see the two crew beneath the hatch cover and relied on VHF radio contact for communication.

The two crew selected what they considered suitable wooden stanchions, each about 1.5m long and about 150mm on each side. As hatch cover 8 was lowered, they placed the stanchions vertically, one at each side of the cover. In order to accomplish this, the crew had to remain under the hatch cover throughout the operation. As the weight of the hatch cover was taken on the stanchions, the gantry crane hooks unexpectedly disconnected from the cover lifting lugs. The sudden increase in weight broke the wooden stanchions and derailed the gantry. The crew member on the port side was able to escape to safety in time, but the crew member on the starboard side was crushed by the hatch cover.

Very quickly, rescue operations were undertaken but the crew member was found deceased.

### Lessons learned

- Improvising work procedures increases risks.
- Never place yourself under a load.
- Gantry cranes are useful tools, but have intrinsic design details that increases risks, such as the crane operator not having a clear view of the entire work area.

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