The Nautical Institute
Marine Accident Reporting Scheme
MARS Report No 193 November 2008

MARS 200875
Fatalities in cargo hold fire

▲ View of fire-damaged tanktop sheathing, spar ceiling and burnt remains of insulation foam

On a general cargo vessel undergoing repairs at a yard, a shore worker was gas-cutting the deck plating of the upper tween deck. The hold had only one means of access available, consisting of a common access trunk with fixed vertical ladder sections. Eight other labourers were engaged in different tasks in the lower hold. Apart from remnants of wooden sheathing on the tanktop and spar ceiling against the side shell, there was an accumulation of flammable debris, consisting mainly of discarded insulation foam both in the tween decks and at the bottom of the hold.

It is thought that falling sparks and carelessly disposed cigarette butts started a fire in the mid-tween deck and was unnoticed by the workers for a considerable time. Fresh air was passing freely through the openings on the upper tween deck and smoke and hot gases began rising via the access trunk.

By the time the workers detected the fire in the lower hold, it was well established in the mid-tween deck and the flames had spread to the access trunk. The gas cutter operator at the top finally became aware of the fire and ran away to raise the alarm.

Three workers from the lower hold managed to scramble through the fire via the access trunk, sustaining severe burns and injuries, but the remaining five were trapped in the lower hold, which was rapidly filling with smoke and becoming deficient in oxygen.

The shore fire brigade arrived and took charge of the fire-fighting operations. The ship's crew was mustered and found correct, but there appeared to be scanty information about the number of shore workers inside the hold. The fire brigade cut several holes in the deck plating and hull and water was pumped into the hold through fire hoses until the fire was extinguished. Later, search teams waded through the smoke-filled and water-logged lower hold and retrieved the bodies of two dead workers. The last three shore labourers survived and were sent to a shore hospital.

Root cause/contributory factors

1. The hot work operation was commenced without any risk assessment or issue of hot work permit;

2. Poor housekeeping resulting in accumulation of flammable debris;

3. Many of the shore labourers were habitual smokers and prone to dispose of cigarette butts carelessly at the work site;

4. The cargo hold had only one escape route;

5. There was no effective deck patrol or fire watch;

6. The yard had no proper system in place for accounting for their personnel.

MARS 200876
Counterfeit EEBDs

Official report: U S Coast Guard Marine Safety Alert 6-08

The US Coast Guard (USCG) has recently learned that counterfeit Unitor model Uniscape 15H EEBD emergency escape breathing devices (EEBDs) are being sold to ship operators and placed on board commercial vessels. The USCG strongly encourages that all vessel owners and operators with EEBDs onboard carefully and thoroughly inspect them for authenticity. If any doubt exists as to the authenticity, they should immediately contact their emergency equipment vendors and/or the manufacturer for verification or replacement.

The number of fake units sold and currently onboard vessels is unknown and could be substantial. The fake reproduction will not fit over an individual's head and the

▲ The authentic EEBD, top, and the fake, bottom

automatic air release valve will not open. A crisis requiring the use of an EEBD will be severely compounded, potentially leading to death, should a crewmember inadvertently rely on a fake reproduction.

The differentiating factors to look for are:

- An authentic Unitor Uniscape 15H is contained in a shiny PVC bag. When viewed from the front with the instruction icons upside down, the zipper opens from left to right, and at the left most section of the zipper is a two centimetre gap covered by a clear tab that has a button closure.
- The fake reproduction is contained within a dull, canvas-like material bag. When viewed from the front with the instruction icons upside down, the zipper opens from right to left, and at the left most section of the zipper there is no opening, although a tab, made of what appears to be the same material as the bag, is present, with a button closure. This unit will not automatically activate.

MARS 200877
Bilge water overflow

Our vessel arrived in a US port with an excessive amount of oily water collected in engine room bilges. This accumulation had resulted from maintenance work which had been carried out on several heat exchangers during the voyage. Disposal of bilge water through the oily bilge separator was not attempted for a prolonged period as the vessel was in coastal waters and the ship's staff had doubts about the efficiency of the filtering equipment.

After berthing, the second engineer set up the lines to transfer the bilge water to the bilge holding tank. Soon after transfer was commenced, oily bilge water overflowed from the bilge holding tank vent pipe on deck. This was noticed by the alert deck crew and the transfer operation was immediately stopped, deck scuppers were plugged and the shore authorities were alerted promptly.

Clean up operations were carried out by the contracted oil spill response company.

Root cause/contributory factors

1. Even though the second engineer was in charge of the operation, he had in fact assigned the cadet to carry out the task, while he attended to other jobs in the engine room;

2. The cadet suspected an obstruction in the forward suction and so he closed that branch valve and was engaged in cleaning the filter. Meanwhile transfer from aft bilge well continued without anyone checking the holding tank sounding;

Editor's note: Why the transfer was not attempted earlier is not explained, as accumulation of water in the engine room bilges presents a pollution threat and also a fire hazard if oily residues are present. The company's safety management system (SMS) must contain written procedures and checklists covering oily bilge transfer and discharge operations.

Readers are reminded that entries in the oil record book must scrupulously document all transfers and discharges of oily mixtures and also record malfunctions of the filtering and discharge monitoring equipment.

MARS 200878
Flash fire from flame heating

The second engineer and a fitter were having difficulty in removing a section of hydraulic oil line. As reported by the vessel, the pipe and system had been previously drained of the oil and the system had been well ventilated before the work began.

In order to free a seized coupling, they decided to heat it with an oxy-acetylene flame. The line suddenly ruptured and the escaping flammable vapour ignited. In the resulting fire, the fitter sustained first degree burn injury on the face and back of his hands.

Lessons learned

It is to be borne in mind that in spite of draining and ventilation, oil adhering to the internal surfaces within a hydraulic system or oil pipeline can produce flammable vapour which can be ignited if hot work is attempted.

MARS 200879
Scalded by steam

One of our vessels reported a second-degree burn injury to the fitter caused by the escape of steam from a condenser which was being opened for maintenance. Before starting the work, the main steam stop valve and condenser steam inlet valves had been ensured shut, but the pressure inside the condenser was not released by opening the drain cock on the shell and this caused the tube stack to suddenly dislodge from the seating position, releasing steam and hot water on to the fitter.

Lessons learned

It must be ensured that components are isolated and pressure released completely before opening up any connections in a steam plant.

MARS 200880
Fatality from fumigated cargo

Official report: MAIB, UK - Accident flyer 1/2008

An able seaman on board a general cargo vessel was found dead in his cabin during the voyage. Four days previously the vessel had loaded a grain cargo which had required in-transit fumigation.

A fumigator-in-charge visited the vessel prior to loading. He completed some checks and departed the vessel only 10 minutes later. Once the loading of the grain was completed, the fumigator-in-charge returned. Aluminium phosphide was inserted into the cargo in tablet form, employing a probe to insert the tablets into the cargo. To fumigate the cargo during the four to five day voyage, the tablets would decompose and produce phosphine gas. Before leaving the ship, the fumigator-in-charge met with the chief officer and provided a short briefing on the hazards associated with the fumigant. In addition to some paperwork relating to the fumigation, the chief officer was provided with two gas masks, one gas sampling pump and five vials for detecting phosphine gas. The chief officer understood from the briefing that he and his crew must be alert for a smell of garlic, which could indicate a possible leak of fumigant gas.

The vessel sailed and proceeded on passage without incident. The edges of the cargo hatches were sealed with expanding foam as bad weather was expected during the voyage. No systematic sampling for the presence of phosphine gas was undertaken during the voyage.

On the morning of the accident, the able seaman had been on deck securing equipment against the rough weather, and was seen in the mess room at lunch time, although he left most of his lunch. During that day, another crewman, whose cabin was on the same deck, noticed a strong smell in the corridor outside the able seaman's cabin. However, he did not worry about it because he and a number of the crew were feeling sick in the rough weather and there was vomit in the laundry sink. At 0800 the following morning, the able seaman was found in his cabin, lying on the floor next to his settee. He appeared to have been dead for some time and all indications are that he died of phosphine poisoning.

When the vessel arrived in port, tests revealed very high concentrations of phosphine gas in the able seaman's cabin and in the adjacent compartment. Both these spaces were sited over the aft bulkhead of the ship's cargo hold, with their decks extending over the cargo space by 0.5m (see photographs).

Despite extensive testing, no obvious pathway was found for the fumigant to enter the cabin from the hold. It was only after the under deck area in the cargo hold had been thoroughly de-scaled that pin holes into the cabin were discovered.

Safety lessons

1. Owners/operators of vessels which may be required to fumigate cargo holds should ensure:

- A copy of the IMO's *Recommendations on the Safe Use of Pesticides on Ships* (incorporated as an annex to the IMDG Code) is held on board the vessel.
- The master and key officers have read and understood the content of the IMO recommendations prior to the commencement of any fumigation operation.
- The suitability of the vessel to carry fumigated cargoes is carefully evaluated before the vessel is committed to loading. Such evaluation should take into account the age, condition of the vessel plus any design eccentricities that increase the hazard associated with the use of pesticides.

▲ 1: The ship's cargo hold

▲ 2: Corrosion of deck plating allowed phosphine gas to leak into crew cabin

2. Masters of vessels which have been fixed to load cargoes that require fumigation should ensure:

- The vessel can safely load the planned cargo. Special care should be taken to ensure fumigant gasses cannot enter the vessel's accommodation and extreme caution should be taken before accepting cargoes requiring fumigation at sea when the accommodation spaces extend over the cargo spaces.
- Ships' staff responsible for the loading and carriage of cargoes requiring fumigation are fully aware of the potential risks and safety precautions required.
- The vessel is equipped with appropriate safety and gas monitoring equipment as specified by the IMO recommendations on the safe use of pesticides at sea.
- Before commencing any fumigation, a thorough briefing is provided by the suppliers of the fumigant covering safety and gas monitoring procedures plus any additional control measures that may be required due to the specific properties of the fumigant.
- A regime of sampling is established at the earliest opportunity, and thereafter throughout the voyage, to detect the presence of fumigant in accommodation spaces and working areas. Sample periodicity should, as a minimum, be in accordance with the IMO Recommendations, or more frequent if so advised by the suppliers of the fumigant.

Feedback
MARS 200808
Navigating in restricted visibility

Low visibility is seldom a factor for not sailing. Most professional mariners sail their vessels in all parts of the world safely and in dense marine traffic lanes and with full appraisal of current situation. However, when vessels are in regulated navigable waters controlled by a VTS, mariners expect professional advice from them. As part of a port system, a VTS must also ensure that the pilotage and VTS services are manned by professionals and that aids to navigation are reliable. In very adverse conditions, instead of issuing a mere advisory to vessels that does not really assist the master in decision-making, a more positive 'no movement' order will ensure greater safety.

Feedback
MARS 200819
Unsafe stevedoring practices

As an occupational health and safety (OHS) practitioner currently working in a stevedoring company, I make the following recommendations:

1. Check in advance of the port call, with the local ship's agent or P&I correspondent, what the governing OHS regulations are in the port and match them against those in the ship's SMS. Be guided by the stricter.

2. Before cargo operations commence, discuss safety matters and jointly complete and sign ISPS, OHSAS (Occupational Health and Safety Management System) and ship-shore safety

checklists with the stevedore representative and hand over a copy of the ship's risk assessment record, as appropriate.

3. Demarcate and point out hazardous areas and control measures already taken by vessel. Also show the designated safe locations and state what personal protection equipment (PPE) is required for personnel involved.

4. Emergency response arrangements in case an accident occurs on board.

5. Cargo loading / discharge plan, other operations and cargo stowage and securing requirements.

6. If ship's cargo gear is going to be used, ensure all maintenance and statutory records are valid and available for inspection.

7. Confirm qualifications and experience of those ship's and shore personnel that will be operating cargo equipment, brief them on operation techniques, safety controls and means of communication (signals, portable radios, working language etc.)

8. Obtain written acknowledgement of the above requirements from the stevedoring company representative.

Require the stevedoring company to submit:

1. Test certificates, maintenance reports and pre-operation checks of the gear they provide and intend to use, eg fork-lift trucks, cranes, slings and ladders.

2. Written confirmation that they have carried out a formal risk assessment for the operation and that they will update it with the information you have made available to them.

3. Written confirmation that they will only engage properly qualified and trained workers, training and those in supervisory roles have sufficient English language skills for the tasks they are going to perform.

4. Duty schedule with names and contact details of shore personnel.

Besides ensuring loss-prevention, the measures suggested above will help protect the master, vessel and owners against unjustified damage / personal injury claims from stevedores.

Feedback

MARS 200835
Loss of both anchors

I appreciated this 'special' on anchoring incidents very much, as I think that a lot of incidents with anchors happen while anchoring (200835), while at anchor (200840) or while under way (200836). I must admit that I too have experienced several incidents, fortunately without any crew injuries or loss of anchors.

However, I am afraid that the SMS procedure mentioned in this case certainly does not apply in all cases, although in the case of MARS 200835 it might be very true that if the procedures were followed, this incident would have been prevented. This procedure might even contribute to loss of anchor in some circumstances.

Editor's note: The safety management system is meant to provide, among other things, written procedures for emergency preparedness and response as well as routine operations. After ensuring that all applicable regulations are complied with, the company is the best judge on formulating the contents of its manuals. If new or revised regulations, industry guidelines, audit findings or experience require, procedures must be amended without delay, and their effectiveness monitored.