The Nautical Institute
Mariners' Alerting and Reporting Scheme
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Providing learning through confidential reports – an international cooperative scheme for improving safety

MARS 201222
Multiple injuries from falling hatch lid

A disused washing machine was being lifted out of the engine room through the hatchway located on the main deck. The hatchway had a portable lid which was designed to be lifted and stowed clear by means of a portable davit fitted on one side of the coaming. However, the crew assigned to this task decided to partially tilt the lid open and temporarily hold it at that angle by using a wire rope sling and chain block attached to the davit. The Junior Engineer (J/E) was on the main deck observing the operation. As the lift was being prepared, the engine room alarm sounded. The J/E leaned over the open hatchway trunk to look into the engine room with his right hand resting on the coaming edge and his left hand taking the support of the partially open lid. Suddenly, the hauling chain of the block parted and the lid fell down, striking a glancing blow to his head and trapping his right hand. He sustained a deep cut on his scalp (not wearing helmet) and multiple compound fractures to his right hand. He was given first aid onboard and repatriated urgently for extensive restorative surgery ashore. It is likely that he may have permanent deformity and disability in his right hand.

Root cause/contributory factors

1. Improper and very unsafe method of opening and holding hatch lid;

2. No risk assessment or tool box talk was conducted before commencing the task;

3. The lifting arrangement and points of attachment were not assessed for condition, stresses and adequate capacity;

4. None of the crew present recognised the obvious dangers arising from the wrong working practices employed.

Corrective/preventative actions:

1. Casualty administered first aid onboard and later repatriated for emergency medical treatment;

2. Defective chain block permanently removed from use;

3. Hatch lid modified to incorporate safer lifting and permanent fail-proof securing arrangements;

4. Incident discussed onboard at safety meetings held on all company vessels, with instructions to ensure that:

- Prior carrying out any task, a proper risk assessment is conducted and recorded;
- A toolbox meeting is conducted and all potential hazards, risks, safeguards discussed and recorded;
- Ship's staff is trained in hazard identification techniques and encouraged in the use of "STOP WORK" action and to report all unsafe situations, and also to report incidents and near misses;
- The proper PPE is in use at all times;
- All lifting gear and accessories have test certificates, are regularly inspected and properly maintained, permanently marked and recorded;
- Work is done safely and methodically without taking shortcuts;
- All defective/uncertificated/untested equipment is permanently removed;
- All hatch lids, doors and closures that could cause injury or damage have permanent securing arrangements and are used appropriately;
- Missing or damaged securing devices are replaced immediately;
- Trainees are supervised and mentored at all times.

◀ View of hatchway showing portable lid and base of lifting davit

MARS 201223
Oil cargo spill from tank washing line drain cock

During a ballast voyage, a product tanker completed tank cleaning operations for change of cargo grade. Her next loading port was in North America, and in anticipation of freezing winter conditions, all fresh and sea water lines on deck, including the tank cleaning lines drains, were left open as a precaution. The supply valves of the individual tank cleaning machines were ordered shut.

The ship loaded a full cargo of diesel oil and sailed. After disembarking the sea pilot at about midnight, the vessel began rolling to a moderate beam swell. By daybreak, the

Chief Officer (C/O) on bridge watch noticed a small pool of oil cargo moving with the roll on the main deck starboard side, between the deck longitudinal and ship's side. The Master was immediately called and the oil spill emergency response plan was activated. Upon the Master's arrival on the bridge, the C/O proceeded to the main deck. Meanwhile, the crew had plugged all the scuppers on the main deck. The crew found that cargo was coming out through the open drain cock on the tank cleaning line branch to 5 Starboard Cargo Oil Tank (COT). This valve was immediately shut, and the deck team then discovered that the supply valve for 5S Tank Cleaning machine was also partially open. The supply valve was then also closed tight. Although no oil or sheen was visible in the ship's wake, it is possible that some oil could have escaped to the sea during the hours of darkness.

Immediate actions taken

1. Clean up operations were commenced and the spilled cargo mixed with water (estimated 500 litres) was transferred to the slop port tank by portable pump;

2. The incident was reported to the office;

3. The Qualified Individual (QI) was notified as required by Vessel Response Plan, who, in turn, reported the incident to USCG;

4. Alcohol testing of all staff was conducted and negative results recorded;

5. All tank-cleaning lines, valves and drains were confirmed shut.

Root cause/contributory factors

1. Faulty design: The supply valve for 5S tank cleaning machine was found partially open despite the order for all valves to be closed. All these valves were fitted with long operating handles very near deck level which could easily get in the way of a person walking past. During the final stages of loading, many ship and shore personnel were on deck in the vicinity of this valve handle as the tank was gauged and sampled. It is possible that anyone, particularly a shore person, could have accidentally kicked the valve handle and opened it without knowing the consequences;

2. Crew negligence: All tank cleaning line valves in this vessel are designed to accommodate a locking arrangement but many locking pins were missing and therefore the valves could not be positively secured in closed position;

3. The drain cock of the tank cleaning line was kept open as a precaution against freezing. This resulted in only a single valve barrier between cargo tank and the environment, which presented an unacceptable pollution risk;

4. With the near-full loaded condition, the tank cleaning machines were submerged in the cargo. The increase in vapour pressure inside the tank due to cargo sloshing resulted in the cargo being pushed up into the tank cleaning line. The cargo then passed through the partially opened tank cleaning valve and fully opened drain valve on to the deck, resulting in the oil cargo spilling on deck;

5. The Company's pre-loading checklist does not specifically require the closing of the tank cleaning line and associated drain valves.

Corrective/preventative actions

1. A safety meeting was conducted by the marine superintendent at the next port and the incident was discussed in detail;

2. Crew re-trained on proper post tank-cleaning/pre-loading procedures;

3. Pre-loading check list has been amended to include the closing of all tank cleaning line valves, drain cocks/caps;

4. Missing locking pins on all valve handles have been renewed;

5. Placards have been posted near all tank cleaning and line drain valves to ensure they are closed prior to any cargo operation;

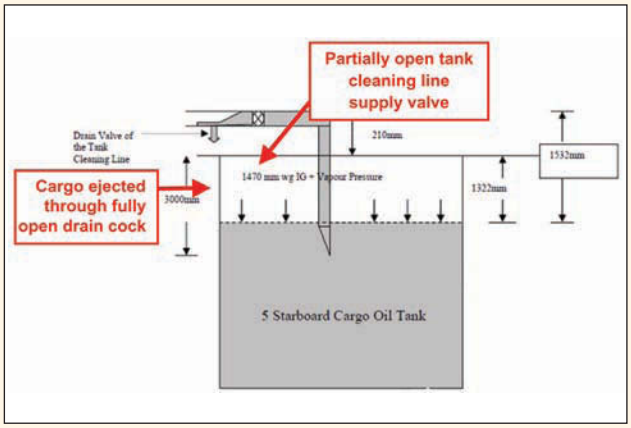
6. Chief Officer's standing instructions have been amended to ensure that all drain valves are positively shut after tank cleaning operations;

7. Incident made part of pre-boarding briefing for all officers.

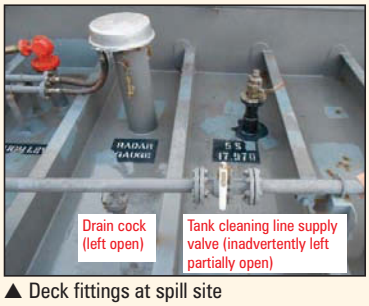
Lessons learnt

1. As a routine, a two-man team must regularly ensure that all deck valves not actually required for a cargo tank operation are secured shut;

2. Risk of pollution exists even when vessels are safely navigating in the open sea.



▲ Diagram showing the circumstances that caused the backflow and escape of cargo from tank cleaning line



▲ Deck fittings at spill site

▲ Tank cleaning line supply valve – note missing locking pin

◀ Corrective action – protruding valve activating handle secured shut with locking pin

MARS 201224

Diesel oil overflow and spill

The vessel was taking diesel oil (DO) bunkers from shore. As previously agreed, when both the DO tanks (port and starboard) were 85% full, the shore pumping station stopped the oil transfer and began to blow compressed air back through the lines to ensure complete draining. However, due to excessive pressure (estimated to be 6 bar), about 500 litres of DO was pushed out of the port tank vent, some of it overflowing over the upper edge of the drip tray or save-all on to the deck.

Clean up operations were immediately started and the vessel's staff managed to contain, collect and clean up all the spilled oil.

Root cause/contributory factors:

1. Inadequate communication between the ship and terminal – the safe maximum pressure for blowing through the loading line was not specified or agreed;

2. Excessive pressure of air used for clearing lines in spite of terminal being warned that the tanks were 85% full;

3. Both DO compartments were small diesel bunker tanks whose vents were contained within coamings of limited capacity;

4. There was some delay in the terminal's response to the ship's order to stop blowing air;

5. The vessel had a trim of nearly 2 metres at the time of the incident.

Lessons learnt

1. A proper risk assessment and toolbox meeting will ensure all personnel are fully briefed and understand the details of the operation and individual roles and responsibilities;

2. Any plan to blow air through oil lines to assist draining must be carefully prepared and fully discussed between ship and shore beforehand. There must be a written agreement on the air pressure, starting and stopping procedures;

3. As a further means of control, at least one valve (preferably the manifold valve) on the vessel should be kept closed and gradually opened to avoid excessive pressure build-up in the line(s) and tank(s);

4. Efficient communications (including a reliable alternate system – Ed) must be maintained and tested regularly during any oil transfer operation.

MARS 201225

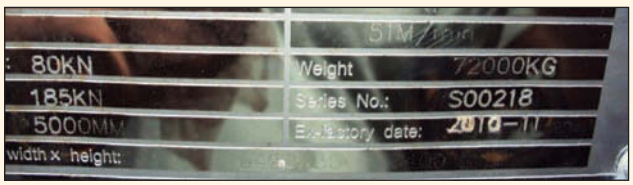
Confusing cargo weight information

A heavy lift vessel arrived to discharge a consignment of project cargo at our terminal. The manifest included some units of a maximum weight of about 50 tonnes. However, many of them had both a paper sticker with shipping marks showing the gross weight written by hand (some overwritten with a figure different from the weight declared in the manifest), and a metal plate prominently affixed with punched numbers showing a figure far in excess of the manifested weight – up to 72 tonnes. Under the terms of carriage, all cargo was meant to be loaded and discharged with ship's twin (Gemini) cranes, each of SWL 26 tonnes giving a total lifting capacity of 52 tonnes.

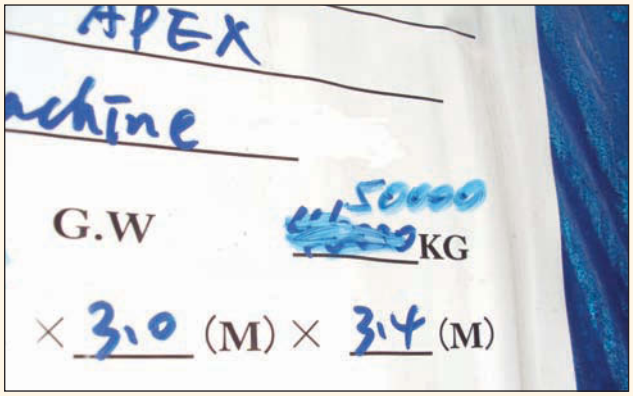
While this confusion was being sorted out, the consignee/receiver insisted that the heavy units were in a 'knocked down' or dismantled condition, and that the manifested/labelled (lesser) weights were correct, especially as the vessel's cranes had already safely loaded them at the load port. A rudimentary cargo pamphlet was produced to support this claim.

To ensure safety of personnel and port infrastructure, we emailed a request to the overseas shipper asking for a document stating the actual weight of each unit as shipped. Having failed to get a response, our terminal served the vessel's Master, agent, stevedoring company and consignee with an indemnity letter, holding them individually and jointly responsible for any loss or damage arising from underestimated weights of the lifts. In the event, all units were discharged safely at the berth and reached their final destination.

▲ Typical deck cargo unit displaying both metal plate and paper label showing different weights



▲ Close-up of metal plate showing a unit weight of 72 tonne against manifested/labelled weight of 50 tonne



▲ Typical label bearing overwritten weight information

MARS 201226

Flocculation of high asphaltene fuel oil due to overheating

One of our vessels reported frequent operational problems on the main engine. The fuel oil had been in storage for some weeks and the line filters were getting choked with rubbery particles which required the engine to be stopped and the solid matter to be removed. Analysis showed that the fuel contained about 8.5% asphaltenes. Asphaltene content over 6% is considered high. Records showed that the storage tank had been heated excessively for some time. The heating was then temporarily turned off during a three week long stay at anchorage at an intermediate port where the ambient temperature was below 10°C, meaning the fuel temperature was reduced to below the normal range. Such a large variation in temperatures causes the asphaltenes to flocculate and solid particles to form.

Fuel oil in storage tanks should not be heated indiscriminately. In cold climates, it is advisable to control steam heating carefully to maintain a temperature of not more than 10 degrees above the pour point of the fuel. Temperature of the oil in the tank should be monitored continuously and recorded to prevent flocculation, which can render the engine unreliable and jeopardise navigational safety.

MARS 201227

Cargo damage caused by overheating of fuel in DB tanks

Uncontrolled heating of fuel oil stored in double bottom (DB) tanks has resulted in cargo damage. Soya bean meal cargo in contact with the tank top of No 4 hold was charred and turned into a hard layer at the bottom of the hold. In other holds, where DB tank temperatures were better controlled, the cargo was not affected. Records proved that the cargo damage was attributable to inadvertent overheating of the DB fuel oil tank in way of No 4 hold during the voyage. The ship had to be placed off-hire for three days for removal and disposal of the damaged cargo and a heavy cargo damage claim had to be settled with the consignee.

Experience has shown that grain, soya bean meal and many other kinds of agricultural produce are prone to damage if they come in contact with heated surfaces. There are also several other bulk cargoes like coal, sulphur and direct reduced iron (DRI), which can spontaneously undergo a chemical reaction and ignite/catch fire when in contact with heated surfaces. When transporting such cargoes, besides taking care to control the heating of fuel oil tanks, the recommendations of the IMSBC Code must be strictly followed to prevent a dangerous situation from developing as well as to avoid cargo damage.

MARS: You can make a difference.

You can save a life, prevent injury and contribute to a more effective shipping community.

Everyone makes mistakes or has – or sees – near misses. By contributing reports to MARS, you can help others learn from your experiences. Reports concerning navigation, cargo, engineering, ISM management, mooring, leadership, design, training or any other aspect of operations are welcome, as are alerts and reports even when there has been no incident. The freely accessible database (http://www.nautinst.org/mars/) is fully searchable and can be used by the entire shipping community as a very effective risk assessment, loss prevention and work planning tool and also as a training aid.

Reports will be carefully edited to preserve confidentiality or will remain unpublished if this is not possible.

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