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Providing learning through confidential reports – an international cooperative scheme for improving safety

MARS 201201
Soot from economiser caused fire

A large container ship was on a fixed trans-continental service, regularly crossing the ocean on a tight schedule. Every month, at the turnaround port, it was a routine for the engine crew to isolate, cool down and open the economiser (also known as waste heat or exhaust gas boiler) to clean out the accumulated soot and unburnt carbon particles. (Being very corrosive, these deposits can cause rapid wastage of the water tubes in the economiser and their eventual rupture. – Ed)

When sailing from this port, the first few starts of the very large marine diesel engine would eject clouds of soot from the main engine exhaust uptake. These particles would rain down on the bridge wings and external decks, often ruining the clothing of the unwary. Subsequently, after the outward pilot had disembarked and the engine was rung up on the sea passage (Full Away), the volume, temperature and velocity of exhaust gases would increase. By day, the soot particles would now appear like a continuous plume of smoke, (burning embers not visible) and, by night, it would appear as if there was a prolonged fireworks display atop the funnel. On many occasions, with a cross wind blowing, the fiery embers would be blown across the channel or fairway, and we would slow down or even temporarily stop the main engine to allow a terrified inbound oil tanker to pass. Generally, the exhaust would become clear after about 20 minutes' steaming at full sea speed.

There were instances when the burning cinders would settle on the fabric roof or 'soft top' of open top containers stowed on the top tier on deck and burn holes in them. As a precaution, charged fire hoses would be kept rigged on the bridge wings and external decks and two seamen wearing overalls, boots, helmets and eye protection, would be constantly directing a fine spray over the area downwind from the funnel.

On one such passage, several slots in the last four cargo bays over the aft mooring winches were empty. It was around lunch time and the crew was in the messroom after having secured the pilot ladder. As expected, the exhaust appeared 'smoky', and unknown to the bridge watch, the strong head wind carried the sparks almost 100 metres astern from the funnel and deposited them on the exposed nylon mooring ropes wound on the storage reels of the mooring winches.

The crew returned to the deck after lunch at about 1300 and noticed a strong smell of burning plastic. On reaching the aft mooring station, they noticed that one of the mooring ropes was on fire. The bridge was informed and emergency stations were sounded and the fire pump was started. The fire was put out within ten minutes but not before the rope had been completely destroyed.

Corrective / preventative actions

1. A fleet circular was issued to all vessels, listing the fire hazards arising from exhaust uptakes, especially after economiser cleaning and during routine soot blowing at sea, and procedures to mitigate the risks;

2. After every economiser cleaning, for the first hour after Full Away, it became standard practice to deploy an additional seaman on the upper deck, in radio contact with the two seamen already entrusted with the task of spraying the container tops from the navigating bridge deck with sea water;

3. Regional planning centres, contracted terminals and deck officers were instructed not to leave the container slots above the aft mooring station empty, especially when sailing from ports where the economiser had been cleaned;

4. Deck crew were instructed to immediately rig the protective covers over the mooring ropes once they had been wound on the storage reels of the winches.

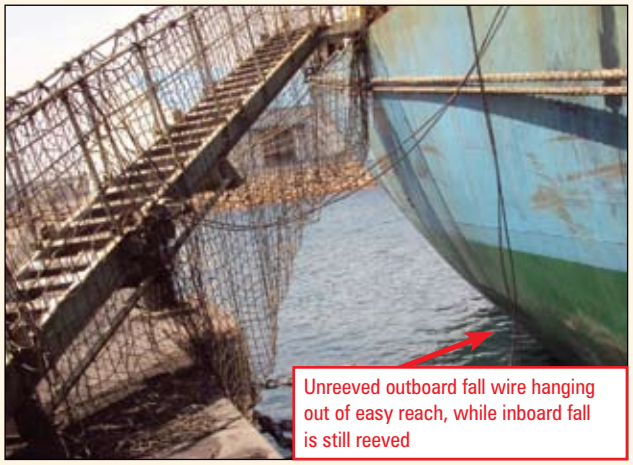
MARS 201202
Problems in deploying accommodation ladders

Accommodation ladders and portable gangways on ships must comply with SOLAS regulation II-1/3-9 and the construction, installation, maintenance and testing requirements as detailed in MSC.1/Circ.1331 (applicable to ships built after 01 Jan 2010), and, additionally, with any applicable local regulations. It is good practice to land the 'foot' of the accommodation ladder on the shore so that the fall wire is not subject to continuous stress. However, at berths fitted with large fenders, there may be a wide gap between the hull and the quay, and slewing the accommodation ladder for landing on the wharf will require shore assistance, can impose high loads on the system and also increase the risk of an accident. For such situations, many vessels are equipped with an approved 'extension gangway' that is designed be secured athwartships to the bottom platform of the accommodation ladder, providing a

safe 'bridge' to the shore. When berthed in ports with high tidal range, or when obstructions on the quay could foul the ladder, it may be more prudent to leave it suspended so that the crew can tend it continuously.

In most designs, the gangway fall wire leads from the winch to an outrigger from where it is reeved through sheaves on both inboard and outboard sides of the ladder. When the ladder is slewed outboard and its foot is landed on the shore, the fall wire on the outboard side tends to lead across the steps, obstructing free passage. On many vessels, the cheek plates of these side sheaves are hinged (similar to a snatch block) in order to allow the crew to temporarily unreeve the wire from the outboard sheave and move it clear of the access.

If the accommodation ladder has to be hoisted in an emergency, precious time may be lost in 're-reeving' the fall wire. This means that this practice must be carefully reviewed. One method of maintaining clear access would be to lash a tall vertical stanchion to the outboard side of the ladder and without unreeving the fall wires, loosely secure the slack wires to the top of this stanchion using short lengths of yarn that can either be released quickly or will part when the winch takes up minimal weight.



▲ Ship's accommodation ladder slewed outboard by a large angle and landed on the shore due to broad fendering on the berth and outboard fall wire temporarily unreeved from the side sheave

◀ A safety net rigged around the accommodation ladder would further hamper the quick re-reeving of the fall wire around the side sheave

Typical suspended accommodation ladder with extension gangway landed on shore. Recovery of or adjustments to ladders in this configuration can also be difficult. ▶

MARS 201203

Mooring wire parted and rope tail lost

One of our tankers was preparing to sail from a terminal after discharging. With pilot embarked and after ensuring that it was safe to do so, the main engine was tested ahead and astern on air and fuel. Perhaps due to an unduly prolonged ahead engine test movement, a sternline (wire rope) parted near the thimble eye connection to its nylon rope tail. This was promptly reported to the bridge by the officer on aft station. Fortunately, it did not result in any injury or damage, and the wire was quickly recovered onboard. The Pilot was immediately informed by the Master, and the shore linesmen were requested to return the rope tail with connecting shackle to the ship. However, much to everyone's dismay, the mooring gang inexplicably removed the eye of the rope tail from the shore bollard and dumped the severed length of synthetic rope along with its fittings into the water, where it sank and disappeared from view. Fortunately, the propeller was not fouled and after tugs were fast, the ship sailed without further incident.

The Master issued a Letter of Protest to the terminal, copied to local agents and managers, holding them solely responsible for all costs, consequences, damages and delays that may occur in future due to the mooring rope tail and fittings being dropped in water alongside the berth by their linesmen. The letter was not acknowledged.

Corrective/preventative actions

Incident report circulated to the Fleet. Safe procedures for testing main engine at berth and in port summarised from operating manual for guidance of all bridge teams.

MARS 201204

Finger injury when working on tank cleaning machine

During routine maintenance of a fixed tank cleaning machine on a tanker, a crewmember removed all the nuts on the base studs, lifted the drive unit slightly and inserted the end of an open spanner (wrench) between the base flange and the drive unit to visually examine the working parts through the narrow gap. During this operation, he had inadvertently placed his left middle finger near the wrench, under the base mounting of the drive unit. Suddenly, the spanner slipped out and the drive unit dropped on his finger, badly crushing it. The injured person was given immediate first aid and was off work for the next three days and was given shore medical treatment at the next port.

Root cause/contributory factors

1. Inappropriate tool used as temporary stopper device;

2. The task was not planned or assigned by the Chief Officer;

3. The crewmember decided to carry out this task on his own initiative and he did not conduct any risk assessment;

4. Crewmember did not follow the correct method of inspection as recommended in the maker's service manual;

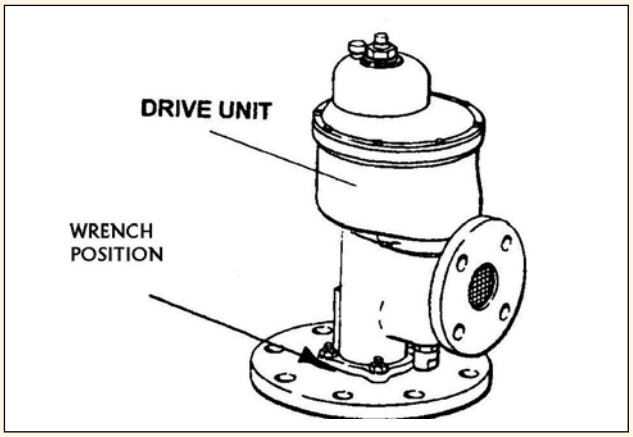
5. Lack of skills and overconfidence on part of the worker in his ability to undertake the task.

Corrective/preventative actions

1. Incident report circulated to fleet reminding ships' staff to consistently follow safe working practices and follow maker's service instructions;

2. Ships' staff reminded to discuss work plan with immediate superior and/or Dept heads before starting work;

3. Responsible persons instructed to carry out and record risk assessment for every planned job. Assigned crewmember(s) instructed to always practice the concept of 'Take 5' before commencing work;



▲ Diagram showing location of wrench (and crushed finger)

MARS 201205
Neglecting the magnetic compass

As a licensed compass adjuster, I was recently required by the local PSCO to adjust the magnetic compass of a large capesize bulk carrier after evidence of unusually large deviations had been observed during the inspection. I was told by the Master that the compass had been adjusted in the last port (in the Far East). As I proceeded with the adjustment, I was assisted by the ship's Second Officer who recounted how the last adjustment had been carried out. To my amazement, he told me that the ship had never left the berth. After making some superficial alterations to the correctors, the adjuster issued an ideal deviation certificate to the Master indicating near nil deviations on all headings. It had no data on the number and positioning of corrector magnets, soft iron plates or Flinders Bar rods.

I was totally appalled by the unprofessionalism of the previous adjuster and also concerned about the lack of knowledge on board the ship to question his method of compass adjusting without even swinging the ship.

Although many of today's seafarers treat the magnetic compass as a relic of a bygone era, I maintain it is still the only navigational directional device not dependent on external electrical power or inputs. It is certainly a shame that this aid to navigation is increasingly being neglected and every shipmaster should be aware of his/her responsibility under international regulations to ensure that all bridge equipment is properly calibrated, maintained and used by the bridge team. There could be serious legal implications if, after a navigational incident, it was found that the magnetic compass's status was relevant. Questions of negligence could arise with regard to the last compass adjuster's work, the crew's failure to challenge it and their passive acceptance of the situation.

MARS 201206
Fatality in ship's cargo conveyor belt system

Edited from MAIB Safety Digest 02-2011; Case 3

During self-discharging of a dry bulk cargo, the engine room rating on watch informed the cargo control room by portable radio that he was proceeding to the conveyor belt tunnels located beneath the cargo holds on his routine rounds. About 45 minutes later, the Chief Officer also went down to the tunnels to carry out his routine inspection and monitoring of the self-discharging system. When he reached the after end of the port side conveyor belt, he found the rating's body between the conveyor belt roller and a supporting beam. The Chief Officer immediately activated the emergency conveyor belt stop system and called for help.

Although the emergency services were quickly on scene, the rating had already died of severe injuries. The rating had not been instructed to carry out any maintenance work on watch and the self- discharging machinery was operating normally during the incident. The reason for the rating becoming caught in the system is unknown. There were no witnesses.

Lessons learnt

1. The machinery at the end of the conveyor belt system was guarded by only a waist-high hand rail. Therefore, it was easy for a crew member to intentionally or unintentionally bypass the rail and come into contact with the moving belt or end roller. There was no safety stop in the immediate area;

2. Ship owners have an obligation to ensure that every dangerous part of the ship's work equipment is provided with guards or protection devices. These are to prevent access to danger zones or to halt movements of dangerous parts before the danger zones are reached;

3. The rating worked alone during his 6-hour watch. His only contact with the cargo control room was by portable radio. There were no procedures in place to regularly check on a lone worker, violating the recommendations in the Code of Safe Working Practices for Merchant Seamen (COSWP), which gives advice on communications for personnel entering and working alone in unmanned machinery spaces;

4. A proper risk assessment of the area could have identified control measures such as enhanced guarding or CCTV coverage, which existed in other areas of the conveyor belt system, and extension of the safety stop arrangements;

5. The rating had been given only verbal instructions on his duties during cargo discharge operations. There was no written job description for this work. A more defined job description might have deterred him from carrying out any extraneous work that could have placed him in danger.

MARS 201207
Crew trapped by steering gear and injured

Edited from MAIB Safety Digest 01-2011; Case 3

On board a coastal vessel at sea, the Chief Engineer instructed the motorman to go to the steering gear flat

and mop up a small quantity of accumulated leaked hydraulic fluid. The steering gear machinery was enclosed by a perimeter railing and as the motorman entered this enclosure, his clothing snagged on the flange coupling of the linkage that connected the rams on opposite sides of the tiller. Simultaneously, a hard-over rudder movement was executed from the bridge, and the large axial movement of the linkage resulted in him being dragged into the narrow gap under the raised walkway frame, trapping and seriously injuring him. A short while later, the Chief Engineer went to the steering gear flat to check on the work and found the injured motorman lying motionless and unable to extricate himself. After he was evacuated from the steering gear space, the motorman was airlifted to the nearest hospital, where he received medical treatment for crush injuries to his vertebrae and pelvic region.

Lessons learnt

1. Areas around moving machinery should be securely guarded to prevent such accidents;

2. Personnel should never enter or remain alone in any unmanned machinery space unless they have advised a responsible person / control station / bridge of their intentions;

3. Warning notices directing the crew's attention to the likelihood of machinery suddenly starting up and moving were not displayed at the entrance of the space;

4. The Code of Safe Working Practices for Merchant Seamen (COSWP) recommends the use of a permit-to-work (PTW) for appropriate tasks. In this case, a PTW might have prevented this accident.

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 and loss-prevention work planning tool and as a training aid.

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

Editor: Captain Shridhar Nivas FNI

Email: mars@nautinst.org or MARS, c/o The Nautical Institute, 202 Lambeth Road, London SE1 7LQ, UK

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