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Seaways

The International Journal of The Nautical Institute

The art of shiphandling

Can simulation really teach it? **p10**

The Nautical Institute

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Focus

One step forward and two back

> Accident investigations need to trace the causes back up the whole chain of people and equipment, potentially to the original design of the ship

Starting with the positive side of the statement above, Dr Suresh Bhardwaj's article explaining the progression of safety science from the simple cause and effect model to resilience engineering and adaptive safety (see pp 14-16) is heartening. We have been promoting for years the concept that accident investigations need to trace the causes back up the whole chain of people and equipment, potentially to the original design of the ship, rather than the common knee-jerk reaction of blaming the Master and crew. More of the official accident reports are attempting to do this, despite the difficulties that the investigators encounter along the way, but many still focus on the shipboard actions to the exclusion of all else. This article builds well on the previous two that Dr Bhardwaj references and contains valuable concepts for us all to take with us in our working lives, not least the human performance considerations that he lists.

On the subject of accidents, it is encouraging that Mr Hilduberg of the Danish Maritime Accident Investigation Board reports that major accidents have become few and far between (see p 12). However, as our colleagues in the P&I clubs tell us, there are still too many, and personal accidents are far too frequent, with the result that claims from this cause are rising. In addition, the cost of claims for the major casualties is climbing alarmingly as ships are bigger, more complex and carry far more cargo. It is for that reason among others that the theme for our Command Seminar series this year is Navigation Accidents and Their Causes (see adverts/flyers for Singapore and Cape Town, and the March Book of the Month). However, we feel we should take issue with Mr Hilduberg's contention that near-miss reporting fails. As a predictive of a major accident waiting to happen, he may be right, but is that really the purpose of near-miss reporting? Is it not actually an integral part of building a safety culture in an open and supportive environment of continuous improvement? Relating it back to Dr Bhardwaj's article, it is surely part of the barriers that need to be in place to help prevent accidents – and in the case of our own MARS scheme it is to ensure that lessons can be learned throughout the industry. The CHIRP programme, which The Nautical Institute is involved with and helps to promote, will take such reports a step further in some cases and proactively try to get the safety issue addressed through the company or authorities where appropriate. Both these schemes are of course confidential to ensure that the reporter is protected from any untoward consequences of raising the issue. That really is the positive conclusion that Mr Hilduberg reaches: 'Seafarers need to feel they can report, without fear of blame, events that reveal systemic problems involving themselves'.

The top ranked input to the Institute's Strategic Plan survey was that shiphandling skills are a major issue and require urgent attention. It is a major project area in the Strategic Plan and will have a number of deliverables to achieve. It is therefore good to see a major training college writing about what they are doing to enhance skills development in this area through simulator training (see pp 10-11). While this may not be ground-breaking in concept or implementation and many colleges around the world offer similar courses, it is a subject that needs to be brought to the fore. It is vital that the take-up of such training is increased, preferably earlier in officers' careers than is often the case. Hands on experience in the safe but realistic environment of the simulator will build confidence and do much to reverse the loss of shiphandling skills.

Finally, what use will be made of Project Martha (see pp 6-8)? The fact that the results of this excellent research have been presented at a meeting within the IMO is encouraging, and there is much data within the study for the regulators to take note of. The industry has been debating fatigue and stress issues for decades but now this research, and its predecessor studies, has put hard facts on the table. We have no doubt that there will be denial aplenty that these are issues that must at last be dealt with. Our paper to the IMO HTW Sub-committee on the unsafe Master/Mate 6 on/6 off manning and watchkeeping system got the predictable thumbs down from various shipowning nations but it is supported by others and by these research studies. It is long since time that the regulators ended the practice and removed these accidents waiting to happen from the workload of the Investigation Boards, as well as saving lives and protecting the marine environment.


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Mariners' Alerting and Reporting Scheme

MARS Report No. 293 March 2017

MARS 201715

Open manhole hazard

As edited from Marine Safety Forum Safety Alert 16-17

➔ During vessel loading, a shoreside foreman was walking on deck where other maintenance activities were taking place. As he made his way on deck the foreman inadvertently stepped into an open manhole. He was able to catch himself and prevent a free fall of 5 metres into the tank. The victim suffered a laceration on his shin, which required three stitches, and some bruising on his forearm.

Lessons learned

- Once opened, a manhole should be cordoned off to provide protection and warning concerning the hazard.
- When a variety of activities are going on simultaneously that involve different work teams the risks are increased. Coordination and toolbox meetings before starting the work can help mitigate these risks.

MARS 201716

Unexpected bottom contact

As edited from US Coast Guard Marine Information for Safety and Law Enforcement (MISLE) activity report 5177142

➔ An ice-strengthened oil exploration support vessel left port under the con of a pilot; the Master and OOW were also on the bridge. About five minutes after having left the berth, and while proceeding at about 3.5 knots, a loud noise was heard and a slight shudder was felt throughout the ship. At the time it was thought that the noise and shudder were caused by the anchor being secured in the anchor pocket. A few minutes later the pilot disembarked and the vessel continued on its voyage.

Chart in use

New chart

Soundings in fathoms

Over the next few hours it was discovered that the number 4 port ballast tank was taking water at a rate of about 8m³/hr. Even though the vessel's ballast pumps could discharge at 100m³/hr, the Master turned the vessel around and they returned to berth for further inspections.

Once at berth, divers confirmed a fracture on the bottom plate of number 4 port ballast tank. New depth surveys of the area of presumed bottom contact were conducted by the National Hydrographic Service. Several previously uncharted shallow areas and rocks were discovered and a new chart was subsequently published.

Lessons learned

- Some isolated ports still rely on charts that are based on relatively old surveys. In this case, the chart used had been issued by the National Hydrographic Service and was based on a 1935 survey.
- Unexpected noises and a shudder were an indicator that something out of the ordinary had happened. Because the ballast tanks were equipped with tank level gauges the crew quickly noticed that one of the ballast tanks was taking water. If you experience unexpected noises, always assume bottom contact and sound all tanks.

MARS 201717

Improper hook-on leads to incident

As edited from Marine Safety Forum Safety Alert 16-15

➔ A supply vessel was working alongside an offshore installation carrying out cargo operations which included the discharge of a small cargo basket. After unhooking the previous back-loaded cargo unit the deck crew 'walked the crane' approximately 15 metres and hooked on a cargo basket. They then left the area and the crane began to take the strain. As the slack was being taken up the lifting bridle caught under the lid of the basket. The crane driver noticed the lifting bridle snagging and lowered the load. Unfortunately, both deck crew had walked away from the basket in different directions and neither was observing the lift. Neither was therefore aware that the lifting bridle had snagged, nor could they see each other to highlight the problem.

After a short time both crew members made their way back to the basket and cleared the lifting bridles. They then stood clear in a safe haven nearby while the crane took up the slack, but once again the lifting bridle caught on the lid, this time buckling the lid and exposing the cargo inside.

All involved, both on the vessel and on the installation, were reported as being experienced in platform support vessel (PSV) operations.

Lifting bridle snagging the lid

Lessons learned

- Good communication between deck crew and crane operator is essential. Repetitive work cycles can leave workers complacent. Complacency eventually leads to accidents.
- The operation and difficulties encountered were witnessed by at least three individual parties (the deck crew, the vessel's bridge team and the installation), but no-one stopped the job.
- 'Walking the crane' (or more precisely the hook) is not best practice. Allow the hook to be repositioned directly over the load, have it lowered, hooked on and then lifted.

MARS 201718

Inert gas plant not used for fear of pollution

➔ A 13,000dwt tanker was in port to load cargo. The shore-based loading master requested that ship's crew run the inert gas system (IGS) to inert the tanks prior to loading. After consultation with the vessel's Chief Officer, the vessel's Master decided not to inert the tanks.

The Master cited operational problems with the IGS. Recent past experience had shown that it was possible that carbon residue and sediments could be introduced into the seawater that was used in the cooling/cleaning phase in the scrubber. These could then be washed overboard and cause pollution.

Since the vessel was below 20,000dwt the Master was able to justify the decision to not inert, as this was in compliance with SOLAS.

Lessons learned

- Even if tankers of less than 20,000dwt were previously not required to have inert gas systems as per SOLAS, this equipment is highly recommended irrespective of vessel size. Reflecting this safety measure, SOLAS now requires new tankers and chemical ships of 8,000dwt or more and built on or after 1 January 2016 to be provided with inert gas installations.
- In this case, the inefficient gas quenching/cleaning was apparently due to a worn de-mister. Proper maintenance and regular cleaning of the scrubber unit could have solved the operational problem.

■ **Editor's comment:** Inert gas systems provide a vital layer of protection on tankers and chemical carriers regardless of vessel size. The International Safety Guide for Oil Tankers and Terminals (ISGOTT) states: 'It must be emphasised that the protection provided by an inert gas system depends on the proper operation and maintenance of the entire system.'

MARS 201719

Experience doesn't always equal safe practice

As edited from Marine Safety Forum Safety Alert 16-24

➔ A vessel was in the process of berthing. The engines and thrusters were still running, and the aft mooring station personnel had just confirmed to the bridge team that the vessel was all fast aft. Before coming to berth, the side (pilot) door had been opened to facilitate monitoring of the rescue boat, which had been launched and recovered for survey purposes. The door was still open during the berthing manoeuvre but a safety chain was in place to indicate the hazard.

Pilot door and chain

The open door was about at the same height as the quayside. A classification society surveyor, who was on the wharf waiting to board the vessel, removed the chain himself and hopped on board through the door.

Lessons learned

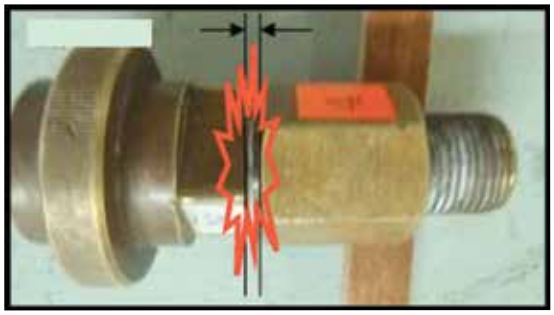
- Side/pilot doors should be kept closed when not in use.
- Open side doors that are soon to be used should be attended by ship's crew trained in their duties. They should be strongly advised to let no one attempt a boarding or disembarkation without a proper gangway in place. A sign should be installed on the safety chain to reinforce the interdiction.
- Even experienced mariners and surveyors can be tempted to skirt safety rules for the sake of expediency. Never be intimidated by the rank or title of a visitor and stick to your vessel's procedures.

MARS 201720

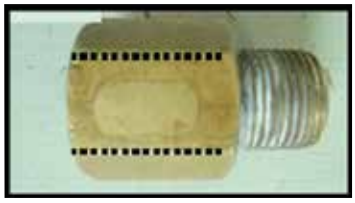
Thread mismatch causes misfire

➔ A ship's officer was tasked to recharge a compressed air bottle from the lifeboat. During charging, the union/adaptor connection between the compressor and the air bottle disconnected and blew away. Pressure in the bottle at the time was about 100 bar; the maximum designed pressure of the air bottle is 200 bar. Luckily, no-one was injured.

The company investigation found that the specification of the union/adapter used on board was a different specification from the original. The male part of the union was a taper thread while the female part was a straight type. A proper fit would have matched fittings; taper with taper or straight with straight.



Taper thread



Straight thread

Lessons learned

- Air compressors create high pressures so accidents involving them can have serious consequences. Training and familiarity with the equipment is needed before use.
- Always inspect compressor fittings carefully before connecting; sometimes mismatched parts can be mistakenly used.

MARS 201721

Carbon monoxide kills quickly

As edited from official BSU report 203-15

➔ On a medium-sized fishing boat with a crew of 17, one of the crew retired to his sleeping quarters after supper. The cabin was shared with three other crew members, but on this night he was alone because the others were working on deck. About an hour after supper, smoke was

seen billowing out of an accommodation ventilation fan.

The alarm was raised and a few crew were able to access the cabin where the seat of the fire was presumed, which was the same cabin where the crew member had retired after supper. They switched off the cabin ventilation, threw a wet towel on the seat of the fire and pulled the unconscious crew member from his bunk. Fire extinguishers were subsequently used to put the fire out.

Meanwhile, the victim was taken to an area clear of smoke and resuscitation manoeuvres begun. Unfortunately, the victim did not respond and was declared dead from carbon monoxide poisoning once at the hospital.

The fire was caused by a household type fan heater that was used to dry the working gear of the crew in the cabin. The investigation also documented many areas in the vessel with 'home-made' and octopus connections as well as other electrical anomalies.

Lessons learned

- Improvised and home-made solutions involving electrical equipment are accidents waiting to happen. The Master's inspections, presumably done at least weekly, should have rooted out this bad practice before it caused a fire and a fatality.
- Carbon monoxide poisoning can kill very quickly, as we learn from this accident. A quick rescue was still not enough to save the victim's life.

MARS 201722

Lock-out tag-out out-to-lunch

➔ A tugboat was in port for repairs. The company's port engineer boarded the vessel to check on the ongoing repairs and in particular the status of the steering equipment maintenance. On his way aft he passed the main breaker panel and noticed the steering pump breakers on the main electrical panel were still energised and there was no lock-out/tag-out (LOTO) in place. As he continued to the steering compartment he looked to see if the rudder motor controllers were in the off position. The controllers were in the off position, but with only one LOTO tag affixed to one controller.

Upon entering the steering compartment the port engineer directed the crew working there to affix the proper LOTO devices to the main breakers.

When questioned about the inadequate LOTO tags, the crew member in charge stated he was distracted and overwhelmed by the shore gang's presence on board and the number of jobs to be completed.

The company investigation also found that although there was a general procedure for LOTO, there was no specific checklist for each piece of machinery.

Lessons learned

- There are no excuses for inadequate LOTO practices. This should be the first thing you do before any job that involves machinery with stored or potential energy release. Go through the proper LOTO procedure no matter what the apparent time constraints imposed.
- Good communication and coordination are needed between shore gangs and vessel crew to avoid unnecessary mix-ups and missteps in procedures.
- In your LOTO procedure, each piece of machinery should have a list of the breakers that must be opened and locked-out prior to work being permitted on that machinery.
- A 'permit to work' programme is a helpful tool to manage work processes and ensure compliance, especially when various parties such as shore gangs are working aboard.

MARS 201723

Blocked tank vent

As edited from Marine Safety Forum Safety Flash 15-22

➔ Following a fuel transfer, the sounding plug for the tank was opened in order to take a completion sounding. A strong incoming air flow was observed from the sounding pipe, which indicated that the tank was under vacuum.

In order to investigate further, the vent head for the tank was removed. A blockage, consisting of large rust scales and hardened dust, was found in the vent pipe at the first elbow, approximately 1.5 metres below deck level. Similarly constructed vents on board were then inspected and found to be in about the same condition.

Blockage

Blockage formation

Lessons learned

- Although the exterior of the pipe was in good condition, there was serious corrosion inside the pipe that prevented proper venting of the tank.
- Vent pipes with horizontal sections can be prone to blockages if not inspected and maintained clear.

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