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Seaways

The International Journal of The Nautical Institute

Need to know

Bulk cargo liquefaction **p12**

The Nautical Institute

Philip Wake OBE MSc, FNI Chief Executive

Focus

Master's responsibilities

> The causes of accidents can often be traced beyond the ship and her crew to decisions taken or pressure applied from ashore

In successive Strategic Plan surveys, members have raised concerns that although the Master's responsibilities are clearly set out in maritime law, the authority with which to carry out those responsibilities is constantly being eroded. Much of this erosion can be laid at the door or on the desk of the management ashore, whose ability to intervene in the running of the ship has been facilitated by improvements in modern communication systems. 24/7 connectivity brings with it a whole set of management challenges at sea and ashore on both the work and the personal level.

On the work front, what steps do companies take to ensure that all their shore staff really understand the Master's responsibilities under law as well as under the company's policies? It is to be hoped that these are fully compatible. Companies must ensure that the Master is given the authority to carry them out.

The question arises most frequently in scheduling and cargo handling matters, which are prone to real or perceived commercial pressure. Any number of casualty reports cite commercial pressure as a contributory cause of decisions taken on board that have resulted in operations going wrong, sometimes disastrously so. Take, for example, liquefaction, on which subject we have a number of articles and reports this month. Captain Paul Walton, speaking at a seminar, helpfully gave the Master's perspective on loading dry bulk cargoes that may liquefy (Class A under the revised International Maritime Solid Bulk Cargoes Code (IMSBC), which came into force on 1 January 2017) and used a case study to illustrate his points (see pp 12-13).

Worryingly, Captain Walton observed that, as a consultant surveyor, he often finds the IMSBC book completely untouched on the bridge, which is not a good starting point for carrying out the Master's responsibilities. Nevertheless, his case study illustrated the increasing commercial pressure imposed on the Master and the mistakes this generated. Fortunately, the ship and her crew survived to tell the tale, thanks to the prudent and seamanlike action of the Master in seeking shelter on the voyage when rough weather started the almost inevitable liquefaction.

Sadly, the fate of the *Bulk Jupiter* and her crew after loading bauxite was catastrophic and, with some similar cases, led to an IMO circular in October 2015 warning that bauxite (a Class C cargo under IMSBC) may liquefy. John Fairclough highlights this and other cases, proposing that IMSBC must be changed to remove ambiguous information and guidance in loading such cargoes (see pp 14-16). He invites reports to our Mariners' Alerting & Reporting Scheme (MARS) to build a body of evidence to back up this need for change and we would certainly welcome such reports. We would then be able to use our consultative status at the IMO to push for change.

Let us also ask a further question in this context. Casualty reports tend to deal effectively with the causal factors on board and the oft-quoted statistic that 80% of accidents are caused by human error is one result. Many are less insightful in tracing the causes beyond the ship and her crew to decisions taken or pressure applied from ashore – although, as Captain Paul Drouin points out, there are valuable lessons to be learned here (pp 10-11). Yet they are a fact of a seafarer's life and may even result in the loss of that life. In the UK, the law allows a charge of corporate manslaughter to be brought against a company and its directors. Perhaps other countries have something similar, but worldwide it tends to be the Master that is criminalised.

Let us all take a New Year's Resolution to fully support the authority of the Master to carry out his or her legal responsibilities without hindrance so that criminal or civil charges do not come into the equation at all. In the meantime, our members and potential members would do well to attend our branch meetings to learn more about the challenges of carrying various types of cargo (see pp 30-32) and enjoy professional interaction at the same time.

Hopefully, it will help them cope with the pressures of the job, unlike the tanker Master discussed in our LinkedIn forum (see p 35). In contrast, we praise the leadership and actions of Captain Radhika Menon AFNI who received the IMO Bravery Award last year for her crew's rescue of seven fishermen in the Bay of Bengal (see Captain's Column p4).

What makes an exceptional Master like her? There are no doubt many factors involved, but professional education and training must play a large role. Within that, mentoring is an essential part (see pp 6-9 and our Book of the Month). Hopefully, we all engage in it as mentor or mentee or both. Many professional officers and executives ascribe their abilities to effective mentoring. It is an important aspect of continuing professional development (CPD), but Jon Reed-Beviere asks whether refresher training and formal revalidation is now needed (see pp 25-26.)


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A blueprint for safety

Learning from accidents and incidents

Paul Drouin FNI
Editor, MARS

Why is it so hard to learn from other people's mistakes? For that matter, why are procedures so often short-circuited or not completed? Procedures, after all, are the distillation of best practices that themselves are a product of past operations that have gone well – but also those that have gone awry. There is something about our human nature that seems to preclude an easy absorption of experiences that we ourselves have not lived through. But before we investigate these questions, a little history.

On 6 March 1987, the ro-ro ferry *Herald of Free Enterprise* left Zeebrugge harbour bound for Dover with 80 crew, 81 cars, 47 trucks and approximately 459 passengers. The weather was fine with very little swell. Yet, four minutes after passing the harbour outer mole the vessel flooded through the open bow door and subsequently capsized. At least 188 persons lost their lives. As events later showed, the bow door should never have been open when the Master increased speed, which created a bow wave that literally sank the ship.

Any number of terrible shipping accidents in the past, and certainly many before the *Herald of Free Enterprise disaster*, some with even worse consequences, could have given rise to similar conclusions as that of the Department of Transport report produced in 1987. The difference was that this report was one of the first to follow the chain of causal factors all the way to the top company management. Indeed, as modern investigation techniques have since shown, unsafe conditions and unsafe acts on board vessels have an intimate and direct link to the management of those vessels.

The *Herald of Free Enterprise* casualty and subsequent report has been credited as the catalyst and inspiration for the International Safety Management (ISM) Code, which has since been an important contributor to the maritime industry in conceptualising a framework for safety and safety culture. Among other attributes, the Code makes management accountable for safety policy and procedures. Additionally, the Code allows crew access to top management through the Designated Person Ashore.

The six functional requirements of the ISM Code:

- Develop a safety and environmental-protection policy.
- Develop instructions and procedures to ensure safe operation of ships and protection of the environment.
- Define levels of authority and lines of communication between, and amongst, shore and shipboard personnel.
- Develop procedures for reporting accidents and non-conformities.
- Develop procedures to prepare for and respond to emergency situations.
- Develop procedures for internal audits and management reviews.

A work in progress

In 1998, 11 years after the capsizing of the *Herald of Free Enterprise*, the ISM Code became a mandatory requirement for certain SOLAS ships and companies operating those ships. In 2008, ten years after the ISM Code was implemented, Michael Molloy penned an article for the American Club publication 'Currents' (no.27) in which he asked;

"So, has the ISM Code worked or not, and was it worth it? In a very important sense, these are the wrong questions. The implementation of the Code was not a single event to be evaluated like the introduction of a technical fix that either worked or did not. It is a process. The question we should be asking is not, 'Has it worked?' but 'Is it working?' The answer is that it has begun to work. Is it worth continuing the effort? Most certainly it is."

> "Procedures are the distillation of best practice"

Today, 18 years since the inception of the Code, I think most persons who know shipping would agree with Mr Molloy. I for one can certainly agree – the Code has been around for approximately half of my sea going career and I have seen a definite improvement in safety since beginning as a cadet in 1979. Although the Code is not a silver bullet, a fix for all, it has nonetheless given the maritime industry a blueprint for safety that is adaptable to any size of company, relatively flexible and goal-based.

As we can see from the functional requirements listed in the column (left), the ISM Code is heavy on procedures and instructions. This has been used to criticise the Code as giving rise to a check-list mentality. In fact, nothing could be further from the truth. Company officials who understand the essence of the Code will be able to formulate a good balance between checklists, procedures and instructions without inundating the ship's staff with useless paperwork.

Procedures and practices

But why such an emphasis on procedures? Quite simply, as I mentioned in the opening, procedures are the distillation of best practices that themselves are

often honed from past operations that have gone well, but also those that have gone awry. Speaking of operations, the medical establishment uses the term 'procedure' as a label to describe how various operations are performed. And many other areas of endeavour are now procedure based with a mechanism for continuous improvement. There is obvious benefit to documenting and adhering to a best practice. This was one of the underlying lessons of the *Herald of Free Enterprise* disaster and the resulting ISM Code.

Why is it so hard to learn?

Now, let us go back to those initial questions at the beginning of this piece. Why is it so hard to learn from other people's mistakes? For that matter, why are procedures so often short-circuited or not completed?

People are certainly hard-wired to learn from their own mistakes. Once you put your hand on a hot stove top, you will not do it again! But what if you tell someone who has never experienced such a mishap 'Be careful, that stovetop is very hot and can burn you'? They will listen, analyse and probably think it true and good. But their appreciation for the hotness of the stovetop – for the searing burn – will not be firsthand. It will not be anchored in their brain as profoundly as it is in the brain of the person who experienced the event. This is the paradigm that must be overturned.

Getting buy-in

One way to help change the attitude to procedures is to insist that they be periodically reviewed by a working group of the crew who use the particular procedure. Not only will this ensure currency of practice and serve as a timely reminder, it will help with 'buy-in' from the very people who need to adhere to the procedure in the first place. In a sense, by participating in the procedural review (or creation of new procedures) the crew will be metaphorically putting their hand on the hot stovetop. They will come to understand the 'why' behind procedural rigour.

As MARS editor, I recently received correspondence from a mariner stating that he didn't see the point in MARS, and that reporting incidents and accidents was not changing anything because they keep happening over and over again. This comment made me think. Although it is true that many accidents are similar and are still happening, we cannot reasonably expect MARS or even the ISM Code to fix everything, once and for all. And let's not forget that with today's almost seamless and continuous communication, we hear of every serious accident almost in real time. It may appear that there are more and more accidents happening, but that is not necessarily true.

Reasons for optimism

In my opinion the paradigm has shifted since the inception of the ISM Code 18 years ago. In general, there is a better understanding by all crew of safety and safety culture than there was at the time of the *Herald of Free Enterprise* capsize. The more knowledge mariners have of other accidents, not just their own, the better and more honed their risk appreciation will be. The better prepared they will be to follow procedures and to report slips, trips and incidents of a more serious nature. But there is always room for improvement – so keep those reports coming to mars@nautinst.org. And learn from other people's mistakes by reading MARS.

Mariners' Alerting and Reporting Scheme

MARS Report No. 292 February 2017

MARS 201707

Unsafe practices become the norm

Edited from official UK Maritime Accident Investigation Branch (MAIB) report 6-2016

➔ A car carrier sailed from port under the con of a pilot, with 1,633 cars and various heavy equipment loaded. The ship proceeded out, making good a speed of 10 kts when the pilot gave the first helm order to starboard. The turn was completed without incident, the ship heeling to port and returning upright as expected. A few minutes later, as the car carrier entered the main channel, the pilot requested that the ship's speed be increased.

Meanwhile, the chief officer was still undertaking final stability calculations in the cargo control room. He became concerned that the indicated metacentric height (GM) on the stability computer was less than his earlier departure stability calculation had predicted. He sent the deck cadet to take soundings of the three aft peak tanks in preparation for loading additional ballast water. The chief officer began setting up the ballast system as he anticipated that he would require additional ballast in the aft peak tanks.

As the vessel made the next turn, this time to port, it heeled progressively to starboard until its rudder and propeller were clear of the water. The vessel then suffered a blackout. Several cargo units and items of ship's equipment broke free from their lashings and shifted as the ship heeled. This resulted in a hole being punctured through the shell plating in way of the ship's gangway recess, allowing sea water to enter deck 6 when it became submerged.

Two tugs were tasked by vessel traffic services (VTS) to proceed towards the vessel and assist as required. Eventually the car carrier grounded. The inclinometer on the bridge was indicating a list of 40° to starboard.

Following the accident, all 24 crew were successfully evacuated from the ship or recovered from the surrounding waters. There was no pollution. A major salvage operation successfully refloated the vessel and it was taken to a safe berth.

Official findings

A key finding of the official investigation is that a departure stability calculation had not been carried out on completion of cargo operations and before the car carrier sailed. Witness and anecdotal evidence suggests that this practice extends to the car carrier sector in general. The critical task of establishing whether the ship has a suitable margin of stability for the intended voyage before departure had been eroded on board. This unsafe practice had become the norm.

Many contributing factors were interconnected with the unsafe practices, such as:

- The actual cargo weight and stowage were significantly different from the final cargo tally supplied to the ship.
- Cargo unit VCGs (vertical centres of gravity) were not considered when calculating the stability condition.
- The vessel's ballast tank gauges were broken. As a consequence, the quantities were estimated. These differed significantly from actual tank levels.

■ **Editor's note:** Master and crew were working in contradiction to the company SMS and good seamanship. Even a cursory safety audit by the company could have easily established this before the accident. Establishing procedures is critical but ensuring they are followed is equally important.

MARS 201708

The lifejacket that didn't float

Edited from US Coast Guard Safety Alert 07-2016

➔ Recent inspections have found some vessels with inadequate lifejackets. The unicellular foam buoyant material within the nylon outer shell had degraded significantly over time, and in some instances was reduced to dust.

The lifejackets were properly stored, kept dry, and not under direct sunlight; however, the storage location was very hot at times. These particular lifejackets, manufactured in China, were the Type 1, 160RT model distributed by The Safeguard Corporation of Covington, Kentucky. They were approximately nine years old.

Lessons learned

Lifejackets should be regularly inspected for indications of failure or degradation, specifically for:

- Compression: The lifejacket may be compressed from many years of stowage.
- Loss of resiliency: The lifejacket is excessively hard, stiff or its foam is brittle. Normally after compressing the lifejacket to about half its initial thickness, the foam should expand to its original dimension in a short period of time.

- Shrinkage: A physical reduction in size may be indicated by 'wrinkling'of the coating on vinyl dipped types or by a loose fitting shell on a fabric-covered lifejacket.

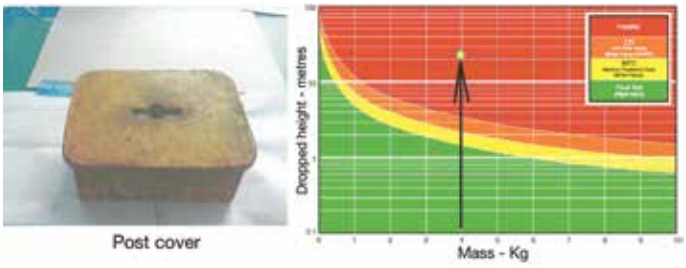
MARS 201709

Near miss – Not dropped but reported

Edited from official Marine Safety Forum 16-14

➔ A supply vessel was unloading a mud skiff and cargo to an offshore platform. During the hook up preparations a post cover was removed from its normal position and placed on the top of the mud skiff while lashings were fitted to the cargo. There was a change of shift on the supply vessel and a new deck crew continued the securing operations and the lift. The new crew did not notice the post cover, and it remained balanced on the mud skiff as the skiff was hoisted to the platform.

The occurrence was later reported by the crew of the offshore platform as a dangerous incident (potential dropped object). Weighing approximately 4kg the post cover, unsecured on the mud skiff being raised to the platform, was potentially a lethal hazard.



Lessons learned

- No procedure was in place for managing the removal and replacement of post covers during cargo operations. As a consequence the post cover was forgotten on the mud skiff and, being unsecured, it became a hazard.
- Reporting incidents such as a potential dropped object, even as in this case where there was no adverse consequences, allows ship operators to improve their procedures and increase safety.

MARS 201710

Crane boom falls into hold

Edited from official report RS 2014e from the Swedish Accident Investigation Authority (SHK)

➔ A general cargo vessel was in port loading packaged timber. The ship was moored to a large barge equipped with a knuckle boom crane. This was being used to load the ship, together with one of the ship's own cranes. Two stevedores worked together in the ship's cargo hold, directing the loading and uncoupling the sling. No other member of the stevedoring team was on board to act as signalman or hatch boss to supervise and control the loading operation from the ship's deck.

The ship's crane had difficulties reaching certain zones of the cargo hold; this resulted in the crane arm being operated close to or even beyond its lower limit. When cargo handling had been ongoing for around a day and a half the topping cable released from the winch drum and the crane arm fell into the cargo hold, landing about half a metre from the stevedores. Fortunately, there were no physical injuries.

The official SHK investigation found, among other things, that;

- The ship's crane had been modified. An extra switch had been installed which, when activated, bypassed the crane's limit switches for maximum lowering. It appears the modification had been made by a previous operator and crew. The reason for the modification could not be determined.
- Bypassing the limit switches allowed the crane boom to be lowered to a level which was too low for cargo handling, and to a point where there was not enough cable remaining on the winch drum to hold the combined weight of the crane boom and cargo load.
- The present crew, relatively new to the ship, had not discovered the bypass switch during the course of their own inspections.
- The crane operator did not perform a full operational check of the crane before the start of lifting manoeuvres. Such a check may well have helped in the discovery of the nonconforming bypass switch.

Lessons learned

- Never bypass safety equipment such as limit switches.
- Always do full operational tests before using cargo handling equipment.
- Always use a signalman during cargo operations.

MARS 201711

Fire in the freezer

➔ A high temperature alarm sounded for the freezer. The chief engineer went to investigate. On opening the main door he could smell burning and he saw flames coming from the back of the freezer.

He activated the alarm nearby, called 'fire' on the radio, and fought the blaze with a dry powder fire extinguisher. The fire attack team soon arrived and took over extinguishing operations. There was no significant damage apart from some food and boxes.

The investigation revealed that the heating element, which is coiled around the drain pipe, had become damaged over time and was touching nearby boxed stores. When the freezer went into defrost mode, which it does automatically twice a day, the heat ignited a box or the packaging that was in contact with the coiled element. The vessel was about 10 years old and the freezer defrost had been operating in this way since new.

Lessons learned

- It appears that there had been no regular checks of the wiring. Such checks could have helped discover the damage the coil had experienced.
- Wires carrying electrical current should be protected against physical damage. In this case, boxes and stores were placed directly against the defrost heating element. Not only could this practice damage the wire, but once the wire is damaged, as in this case, it could initiate combustion with contacted boxes.

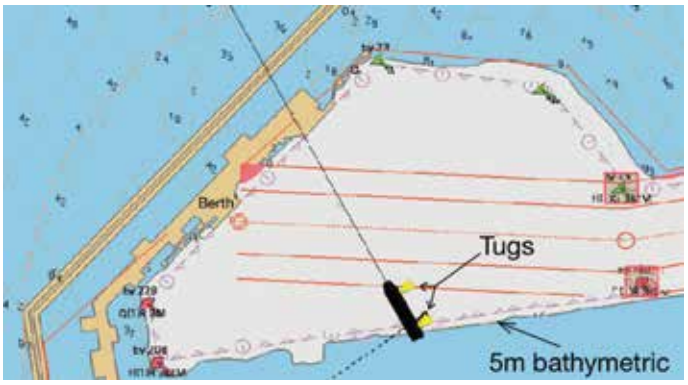
MARS 201712

Bottom contact goes unnoticed

➔ A relatively small LPG carrier, in ballast, was being manoeuvred under pilotage in port with two tugs secured on the starboard side. The vessel was equipped with twin propellors and rudders.

Once near the berth, the vessel was pivoted to starboard so as to come port side to. Forward speed was now near zero and both tugs were helping execute the manouevre. Due to the moderate north east wind the vessel began to drift astern during the turn. The vessel was drawing 5.3m aft and as the stern came close to the 5m bathymetric line the Master informed the pilot. The pilot did not appear to take any specific avoiding action and the Master did not challenge the pilot further.

The pivoting manoeuvre was continued, as seen in the diagram, and although the stern swung through water shallower than the aft draft, no impact or vibrations were felt. Within a few minutes the vessel was secured alongside the berth.



Unknown to the Master, pilot and crew, the port side rudder had made contact with the bottom during the pivoting manoeuvre, causing the rudder stock to turn within the steering gear actuator by almost 25 degrees from its midship position. However, the rudder indicators were showing that the rudder was still amidships. This situation was only discovered upon departure when the steering was found to be unreliable and inexplicably unresponsive. The vessel quickly went to anchor and divers soon confirmed that the rudder was misaligned, although the rudder itself was physically undamaged.

Lessons learned

- Before beginning a manoeuvre such as turning your vessel over 90° in a restricted waterway, ensure the vessel is appropriately positioned to safely accomplish this move. In this case, given the NE wind, the turn appears to have been initiated too close to the southern edge of the dredged area which left little margin for error while swinging to starboard.
- In this case, the rudder tests before departure did not reveal the misalignment that had occurred during the previous berthing.
- Even though contact with the bottom had been initially discounted due to the lack of vibrations or other indicators, the stern had swept through an area of less depth than the draft; contact should have been assumed and verified before departure.
- One of the key principles of BRM is the 'challenge'. In this case the Master 'informed' the pilot of the imminent danger, but appears not to have insisted that positive action be initiated to avoid the shallow area astern.

MARS 201713

Getting more than a charge

Edited from Marine Safety Forum Safety Alert 16-09

➔ A small fire was discovered in a crew member's cabin and quickly extinguished. The crew member, who was not in his cabin at the time, had left a battery pack used for charging small appliances in the 'charging mode'. The investigation to date seems to indicate that the battery pack probably overheated causing the unit to melt. The battery pack under review appears to be an inexpensive, low quality unit.

Lessons learned

- The use of non-original chargers for domestic appliances should be prohibited.
- The charging of power banks should be regarded with caution and risk assessments undertaken.
- All electrical equipment brought onboard a vessel should be checked and rated against the ships power supply by the engineering team.
- Never leave domestic electrical components charging or on standby unattended. If you leave the area switch everything off at the source or unplug it.

Visit www.nautinst.org/MARS for online database

MARS 201714

Unprotected falling hazard nearly lethal

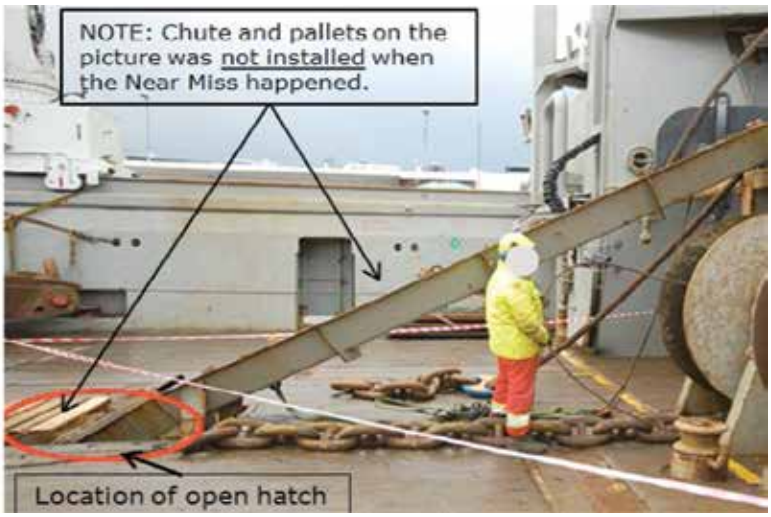
As edited from Marine Safety Forum Safety Alert 16-16

➔ Preparations were underway to load anchor chain into the moon pool locker, and the hatch cover had been temporarily removed prior to the installation of the chain guide (chute). The hatch had an opening of 155x85 cm and the locker was approximately 10 metres deep.

While attending to a related task on deck, a crew member stepped back and fell backwards into the open moon pool hatchway. As he fell he was able to turn slightly to his right and grab the edge of the hatch opening with both hands. He then managed to get his right elbow over the edge of the hatchway and, shouting, attracted the attention of others. Crew members subsequently helped him to safety.

Lessons learned

- Once opened, deck hatches and accessways should always be immediately cordoned off and indicated as a danger.
- Always do a risk assessment, even if it is just a mental check of dangers, prior to and during a task. Think of 'what could happen'.



In the Nautical Affiliates panel in the January issue of Seaways, we referred to HC Maritime Consulting Pty Ltd as HC Marine Consulting PTY Ltd. Our apologies for the error.