

Seaways

The International Journal of The Nautical Institute

Manning and training

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Focus

Wake up calls

“Many safety improvements can only be achieved by understanding human nature and educating to combat its tendencies”

With apologies for the pun on my name, it is worth pointing out that *Seaways'* articles and letters are often an alert to the entire industry to address issues that are detrimental to the safe operation of the ship. This has always been the case from the earliest days of the Institute. We are indeed fortunate that so many members have been, and are, prepared to put their professional knowledge, intellect and passion at the disposal of others by contributing in this way. In many respects, this input applies equally to commercial and naval vessels as there are plenty of operations and hazards that are common to both, even though there are obvious differences in their primary roles.

This month is no exception, with a range of articles and other contributions that raise awareness of shortfalls in our industry. Most of these have been well known for decades, if not longer, and yet are still with us and still resulting in fatal accidents, damage and costly insurance claims. Is it really so difficult to operate safely? Why is it that the swathe of regulations and inspections are perceived to be failing in their purpose in this regard?

Collision avoidance

Continuing his series on avoiding collisions, Captain Yashwant Chhabra identifies that misinterpretation of the Colregs, rather than ignorance of them, is often the cause of collisions (see pp 14-16). He provides some clear examples to illustrate his point and explains a number of the Rules that often cause confusion, including the use of Not Under Command (NUC) signals. He also points out that the Rules contain ambiguities and in some cases there are contradictions between one Rule and another. This is certainly an article that all navigators should read carefully and we hope that Masters will make use of it in bridge team discussions on board.

We have a number of other contributions this month on the theme of collision avoidance. These include a letter taking issue with the Stand-on Rule (see p 34) and a useful LinkedIn debate on the MARS 201542 report concerning a collision in a Traffic Separation Scheme (TSS) between a VLCC and a Capesize bulker (see p 35). An article from Peter Dann examines the benefit of teamwork in gaining time to take and implement decisions (see pp10-13). He

argues that technology on the bridge is part of the team and that the human/machine interface is of great importance. This is recognised at the Institute and has been the foundation of our long running project on the Human Element with its *Alert!* Bulletin, generously funded and supported by the Lloyd's Register Foundation for the past 12 years.

A clear example of this is the recent advent of ECDIS on the bridge. Its use needs to be based on effective training, as set out in the industry agreed guidance published by the Institute, and procedurally built into the bridge team's navigational work. Arne Sagen supports the view that use of ECDIS is an organisational issue (see p 30) and is right to contend that it is still in a development phase, given that the implementation schedule runs through to 2018.

Enclosed spaces

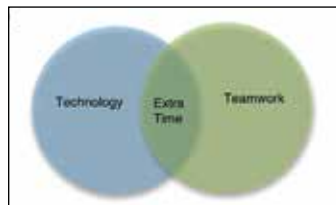
There are of course many other types of operations where safety needs to improve and which have been with us for many a year. Enclosed space entry is an example and Dr Nippin Anand questions whether the real risks are understood (see pp 6, 8-9). There is no doubt that seafarers are still being killed and injured in enclosed spaces and too often the investigation merely blames them for not following procedures. More regulation and tick box drills are clearly not the answer as there are plenty of them already. In his letter on page 34, Captain Michael Lloyd takes accurate aim at the ineffective implementation of many regulations emanating from the IMO through to flag and coastal states. Many of these safety improvements can only be achieved by understanding human nature and educating to combat its tendencies. This will be a long process and requires investment.

Similarly, joined-up regulation, education and training is needed to address issues with the efficient and careful carriage of cargo. John Fairclough looks at keeping cargoes dry and pities the confused Chief Officer faced with P&I Club advice on the weather-tightness of hatch covers set against the condition of the lids and packing which have just passed a class survey (see p 24).

In all probability his reports to the company that remedial work is needed will be met with disbelief and yet seaworthiness (class focus) does not necessarily equate to cargo worthiness (P&I concern).



p4



p10



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p36



Mariners' Alerting and Reporting Scheme

MARS Report No. 276 October 2015

MARS 201555

Elevator fatality

Edited from the official report of the Hong Kong SAR Marine Department

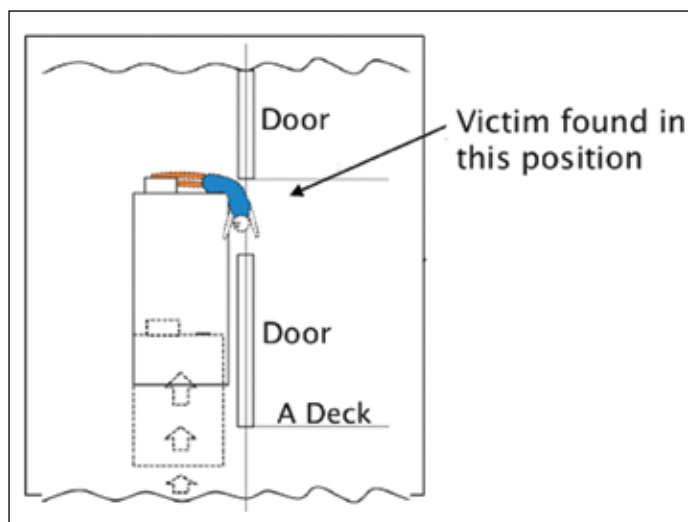
→ Routine inspections and maintenance of shipboard equipment had been scheduled while the vessel was at anchor. A 'tool box' meeting was held in the engine control room where the assistant electrical officer (AEO) said he wanted to check the ship's elevator that day to try and find the cause of an abnormal noise. The second engineer instructed that he should be assisted by the fourth engineer and told him to take all necessary precautions as per the procedures.

The men posted red hand-written warning tags 'Elevator Under Maintenance' on every elevator doorhandle on each floor. Then, using the emergency key to open the landing door on B-deck, the fourth engineer changed over the AUTO-MANUAL selector switch on the elevator control panel mounted on the cage top from 'AUTO' to 'MANUAL' position. This meant pressing the individual buttons on each deck would not cause the elevator to function.

After that, the AEO joined the fourth engineer on the elevator top; he proceeded to control the movements of the cage by pressing the up and down button switches on the control panel to detect any noise during running. This caused the elevator to slowly move in the desired direction, but after about 10 minutes they came out without having determined the cause of the noise.

The two men then proceeded to other duties, but the AEO returned alone to the elevator. Shortly thereafter, loud screaming was heard coming from the elevator location. Crew quickly came to the elevator and found the AEO trapped in the space between the elevator cage and the shaft.

With some difficulty the AEO was pulled out of the cage and transferred to ship hospital. Throughout the operation, the crew tried to communicate with the AEO but got no response. He was later pronounced dead.



The company investigation found it probable that the switch on the control panel at the time of the accident was set to AUTO. Other safety devices were most probably bypassed; as such, any calls from decks above B-deck would cause the elevator to move up automatically at a speed of 30 metres per minute, which is the nominal speed of the machine.

The investigation into the accident revealed that the main contributing factor to the accident was that the elevator safety procedures issued by the company were not closely followed by the personnel. Additionally, the work was prepared without sufficiently appraising the associated risks.

■ **Editor's note:** One of the principal contributing factors to many accidents is crew NOT following procedures. How ironic, and unfortunate in this case, that companies try and limit risk by writing procedures yet have crew bypass them in order to 'get the job done'. But in many instances this is not just a manifestation of individual rogue behaviour. The leadership has probably tolerated procedural shortcuts and 'telegraphed' to crew their implicit acceptance of these unsafe acts.

MARS 201556

Hot oil splatter danger

→ The vessel was at sea in good weather with no rolling. The galley crew members were going about their regular duties, preparing for lunch. The second cook lifted a pan containing approximately four litres of hot oil from the stove and walked towards a nearby rack to store it out of the way. As he tried to place the pan on the rack his right hand lost its grip on the pan handle; in a failed attempt to regain grip, the pan, now being held only by the left hand, tilted heavily to the right and the oil spilled out of the pan. Some of the spilled oil made contact with a significant area on his right arm, causing second degree burns.



The company investigation found, among others, the following:

- The small, all metal handle of the pan did not provide a good grip and had no thermal insulation areas.
- The selected location for placing the oil was inconvenient as it involved bending down and reaching into the rack to place the pan.
- The oil was not allowed to sufficiently cool down before being picked up to move.
- Wearing a full sleeved cook's shirt could have greatly reduced the consequence of the burn.

The company's safety action subsequent to their investigation included among other things;

- Intensify behaviour-based safety observations in the galley
- Revise the company SMS to prohibit shifting of hot oil in pans until sufficiently cooled.

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- Revise the SMS to clearly indicate the appropriate clothing for certain tasks. Long sleeves to be used during frying, handling of hot objects otherwise, and cutting. Short sleeves may be used during washing, with other appropriate PPE.
- Revise the SMS to ensure all frying pans and boiling pots ordered in the future have handles that are either insulated or large enough to be used with gloves.

MARS 201557

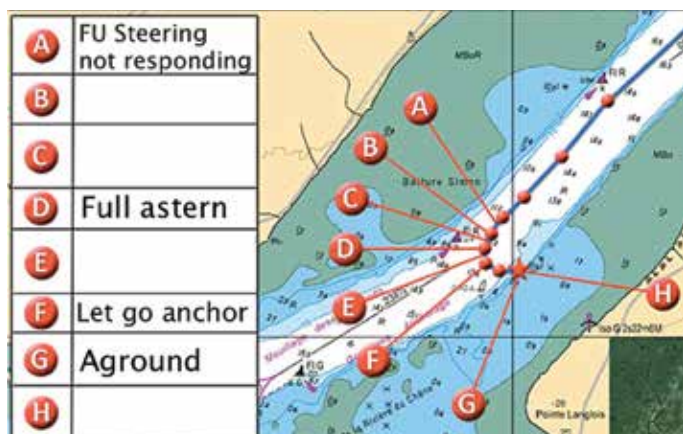
NFU to the rescue – or not

Edited from official TSB report M14C0045

➔ As the vessel made way in restricted waters, the helmsman was at the main console using the wheel to steer the vessel in full follow-up (FU) mode. While on a course over-the-ground of 221° with the rudder amidship, an alarm light on the steering control alarm panel lit up and an audible alarm sounded on the bridge. The chief engineer, who was on the bridge, asked the OOW what the alarm was, and the OOW responded that it was the autopilot override alarm. Shortly after this exchange, the vessel started to veer to port, towards the south side of the river, and the helmsman reported that the helm was not responding.

After the steering had been switched to non-follow-up (NFU) mode, the OOW, chief engineer, and helmsman each tried to use the NFU tiller switch on the right-hand control panel to move the rudder, but the rudder did not respond. They then tried toggling between steering modes using the switches on this same control panel, but the rudder still did not respond.

The Master arrived on the bridge shortly after and also attempted to actuate the rudder using the NFU tiller switch on the right-hand control panel, but to no effect. He then ordered the OOW and the bosun to the forward mooring station for an emergency anchoring. Although the anchor was dropped soon afterward, the vessel nonetheless grounded on the SW side of the river.



On the centre console panel there is also a short black 'override' joystick that can be used to steer the vessel (NFU mode); however, on this vessel, it was not the practice to use this joystick. The joystick does not have an identification label, nor does it have a protective covering or any other locking feature to prevent accidental activation. Only a light touch of this override joystick is necessary to activate it and give steering control to the joystick while disabling all other means of steering in use. To reactivate the other means of steering after the override joystick has been activated, an operator must press the override reset button on the steering gear alarm panel, which resets the steering control system to its initial condition.



The official investigation found that, among other things:

- Steering control from the steering wheel was likely disabled when the unprotected override joystick was inadvertently touched.
- The bridge crew was not adequately familiarised with the vessel's steering control system and did not know how to regain steering control after the override alarm activated.

Other lessons learned

- If critical bridge systems, such as steering gear control systems, are not designed and arranged to be straightforward and intuitive with safeguards to minimise human error, there is a risk that an operator will not be able to respond quickly and effectively in the event of an emergency.
- If crew members are not familiarised with all aspects of the operation of safety critical equipment, such as the vessel's steering control system, there is a risk that they will not have the knowledge required to operate the system proficiently or regain control in the event that it is lost.

■ **Editor's note:** In many accident reports where FU steering is lost, crew are not familiar enough with their steering systems and NFU is left untried. In this instance, the bridge team had the right reflex to try the NFU – but not the correct joystick. The only NFU that could have saved them was the override joystick on the centre panel – the one they didn't try. Unfamiliarity with the equipment and lack of identification were the primary contributing factors. The fact that the override joystick was unprotected could also be viewed as an unsafe condition.

MARS 201558

Fixed CO2 release goes unnoticed

As edited from USCG Safety Alert 6-15

➔ During the annual servicing of a KIDDE CO2 system on a passenger ferry, it was discovered that an undetected discharge of the CO2 system within the emergency generator room had taken place. Although the time of the inadvertent discharge could not be determined, the cause was a worn internal mechanism within the control head.

The crew was unaware of the discharge in the emergency generator room because the space did not require any indicators (eg alarm, smoke/heat detection) to alert them of the discharge and was unoccupied during discharge. This circumstance presented three latent unsafe conditions:

- 1 The failure could have occurred while someone was within the space;

- 2 A person could have entered the space after the release, and;
- 3 The space remained unprotected for an unknown period of time.

Identifying the status of a fixed CO₂ system can easily be done by eye. The control head of the valve has a slot that lines up with either the 'set' or the 'released' position and the indicators are the same whether the control head is electrically operated (left photograph) or pneumatically operated (right photograph). The bottom photo is an example of a second visual indicator for checking system status. It indicates the pressure switch position for the CO₂ system. If the indicator is in the down 'set' position, no CO₂ has been released and the system is ready for operation. If the indicator is in the up position, it indicates that the system has been 'operated' (released) and that the proper servicing company should be contacted immediately to bring the system back to readiness.



Due to the risks associated with an inadvertent discharge of a fixed CO₂ system, it is highly recommended that owners and operators ensure that appropriate vessel personnel:

- Receive adequate training to perform routine inspections of their vessel's fixed CO₂ systems and fully understand their operation, particularly those protecting large spaces or multiple areas.
- Frequently review and update operating manuals, checklists, and safety management systems associated with vessel extinguishing systems onboard.
- Post clear instructions for fixed CO₂ system emergency operation.

MARS 201559

Unexpected lifeboat launching injures crew member

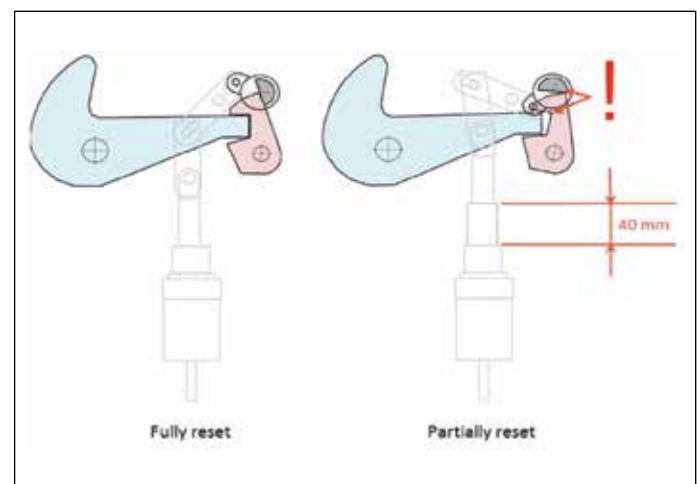
As edited from official ATSB report 307-MO-2014-002

➔ During maintenance, the second engineer noted that the free-fall lifeboat release system hydraulics appeared to be losing oil and he wanted to personally confirm that all was in order. In order to enter the craft, the free-fall release safety pin had to be withdrawn. Once inside the lifeboat and after topping up the reservoir with oil, he decided to

pressurise the system and identify any obvious oil leaks. After pumping the handle three or four times he felt the lifeboat shudder and move. (Under normal circumstances, the lifeboat's hook release device would require about 10–12 cycles of the hydraulic pump to trip the on-load release.) He saw that the lifeboat had begun to move down the launching rails; as there was no time to escape, he sat down in a seat and attempted to fit the seatbelt. The two simulation wires, in place to allow for launch training but so as to prevent an actual launch, failed under the shock load and the lifeboat launched into the sea.

On the bridge, the OOW was alerted by crew who had witnessed the launch. He immediately activated the ship's general alarm, slowed the ship, and made an emergency announcement over the public address system. Meanwhile, although injured, the second engineer was able to start the lifeboat motor and manoeuvre close to the ship. He was recovered soon afterward and later diagnosed with a fractured kneecap.

During the investigation it was discovered that the oil level was not actually low; oil had remained in the ram and had not returned to the pump reservoir. Additionally, it was found that the reset alignment arrows could indicate that the hook was in the correct reset position, even if it was actually only in a partially reset position. This condition was not apparent because of a cover fitted over the release mechanism and the lack of an indicator for the release linkage to indicate if the ram had fully retracted (or not). Thus, the on-load release was unintentionally tripped after only four operations of the hand pump, because it was only partially reset.



Yet, even when released, the lifeboat should not have ended up in the water. Many other factors contributed to the final, rather wet, outcome, including the following:

- There was no equivalent, alternative arrangement to the safety pin to prevent inadvertent tripping of the free-fall lifeboat's on-load release during routine operations, such as inspections and maintenance.
- The simulation wires were longer than required and had not been installed as per the manufacturer's design guidance. Therefore, once the on-load release was tripped, the lifeboat travelled significantly further than it was designed to during a simulated release, with a proportional increase in the shock load placed on the wires.
- The manufacturer's calculations did not take into account the shock load imposed on the simulation wires or the lifeboat and launching frame mounting points.
- The Recognized Organisation's process for the approval of the simulation wires for 'maintenance and testing' had not taken into account the shock loading that would be experienced during testing.

Making a difference to the shipping community

The Institute gratefully acknowledges the support of its Nautical Affiliate partners. Through their contributions, MARS saves lives, prevents injuries and contributes to a more effective and safer shipping community.



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