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Seaways

The International Journal of The Nautical Institute

Bridge team cohesiveness

The Nautical Institute

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Focus

Making the most of skills

> There has been no change to the actual task which is, and will always remain, to navigate the ship safely from one port or place to another

There is no denying that the means available for navigating ships have changed a great deal in the last few decades, and that instrumentation is increasingly important. However, there has been no change to the actual task which is, and will always remain, to navigate the ship safely from one port or place to another. Earlier generations of seafarers can rightly claim to have adapted to major changes in ship systems – the solving of the longitude problem, the shift from sail to power-driven, invention of Radar, radio direction finder (RDF), terrestrial positioning systems (Decca, Loran, etc) and the earlier satellite systems. We have been through Radar-assisted collisions without solving them entirely, as they still happen despite all the training and improvements to the equipment, and now have ECDIS-assisted groundings. It is probably equally unfair to both man and machine to blame the equipment, as it is the human element (man-machine interface) that actually causes the casualty.

That is not necessarily to lay the primary blame on the operator, as there are many other influences and decisions in the causal chain that must be assessed. These include the design of the equipment and its features, which may confuse rather than assist the operator; the purchase decision which may have gone to the cheap end of the market resulting in a less than adequate system; the siting of the equipment on the bridge and whether it is integrated into the navigation system or stand-alone; and of course the amount of training provided on its use. While the provision of training is clearly a responsibility placed on the owner/manager by the ISM Code, we are equally sure that it is an individual responsibility for any navigating officer to do all they can to become fully competent in the equipment/system provided for their use. That includes the maintenance of the full set of skills in safe navigation, including the core terrestrial ones of bearings, compass errors, etc – and use of the Mark 1 eyeball looking out of the bridge window, as many writers for *Seaways* remind us frequently.

That said, making full use of the capabilities of modern systems and understanding their limitations is equally important. Two articles this month focus on the potentially riskiest part of the voyage, the arrival and departure from port. Captain Ed Verbeek explains the use of the Predictor feature, when to use it and when not to, but also the importance of maintaining use of visual observation out of the bridge windows to check position and progress (see pp 11-16). Captain Nick Nash also explains making full use of his cruise ship's navigation equipment capabilities whilst also utilising fully the personnel at his disposal, including the Pilot, and integrating them into a well trained and cohesive bridge team (see pp 6-10). He shows that it is important to plan the port entry/departure in detail and set up the equipment carefully, with refinements for subsequent visits to the same port. Equally, the arrangement of the ship's officers and the Pilot to form the team is adapted for the port rather than being rigidly set, but the ethos of an integrated team is maintained.

Continuing Professional Development (CPD)

Contributors to *Seaways* are certainly providing CPD to our readers, and in writing their articles, letters or reports are engaged in their own CPD. We maintain that all our members are in effect undertaking CPD – by being members, reading *Seaways, The Navigator,* attending branch activities, etc – whether they are consciously planning their CPD or not. As an efficient CPD Module has been developed and built into the Members' Area of our website, we would encourage all members to make use of it. Theresa Nelson, our Training & Quality Manager, encourages you to do so on p22, with guidance on the planning, undertaking and reflection process. She is implementing refinements to the Module to improve it further based on useful feedback from the initial users of the system.

The benefits of CPD, and specifically writing for *Seaways*, can be seen from our Chief Officer's Column this month. Alex McDonald not only won the Trinity House 500th Anniversary Prize (£500) for his earlier contribution on improving ECDIS but was invited to visit the UK Hydrographic Office as a result (see p 4). This really is CPD in action with personal and industry wide benefits accruing. Our thanks to the UKHO for attentively reading *Seaways* and proactively engaging with our members. That they believe in the value of end user input is clearly demonstrated by this invitation and their Far East Manager's ECDIS presentation to the Hong Kong SAR Branch (see p31) which clearly got a very good debate going and again shows the benefit of branch activities.


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Mariners' Alerting and Reporting Scheme

MARS Report No. 285 July 2016

From the Editor

In this July issue we would like to continue our complementary initiative to invigorate discussions on safety and lessons learned. For April through June we sought your input on Slips-Trips-Falls. In this issue of MARS you will find several examples of preventable falls that caused serious injuries – and measures that could be taken to prevent them.

For the next few months we would like to hear from you on Enclosed Spaces. Have you had any incidents or accidents related to enclosed spaces? Is your company now adhering to the bimonthly enclosed spaces drills as required by SOLAS? How do you make these drills engaging?

Of course, we are always on the lookout for your reports of other near misses or accidents; please keep those coming! But in the next few months we would especially like to hear from you, in your own words, about any enclosed spaces incidents that have occurred on your ship. Please send your reports to mars@nautinst.org

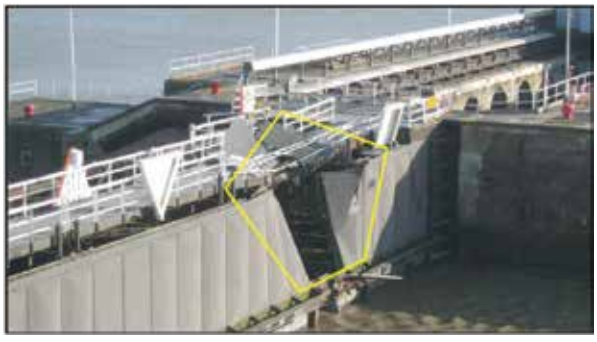
Capt Paul Drouin FNI

MARS 201632

Ship rams lock door

As edited from BSU (German marine accident investigation board) official report 16/15

➔ A 78 metre supply ship was entering a lock in daylight. On approach the vessel's speed was gradually reduced to one knot. Cooperation between pilot and the bridge team was reportedly very good; while the Master set the speed on the twin Controllable Pitch Propellers (CPP) in accordance with the advice of the pilot, the pilot adjusted the ship's heading using a tiller control that acted on the starboard azimuth thruster. Once in the lock the heaving lines for the fore spring and stern line were landed.



Damage highlighted in yellow

In order to get a better view of the operations, the pilot handed the tiller duties over to the OOW and went to the starboard wing, where he could see that the vessel was progressing as planned. When the distance to the forward gate was about 50 metres the fore spring and stern line were placed over their bollards. At about this time, the ship suddenly began accelerating. The pilot ordered 'Full astern and hold fast the lines'. The Master relayed these commands to the stations forward and aft and set the two speed control levers to the full astern position, but the ship continued to accelerate.

Less than two minutes after losing control of the speed, the vessel rammed the lock gate at a speed of somewhat more than four knots. All the propulsion units were immediately switched off and a damage assessment initiated. Among other damages, the forepeak was punctured and the ship lost some of her buoyancy. The lock gate was also heavily damaged.

What went wrong?

The Master initiated the sternward manoeuvre by turning both azimuth control levers 180°. In doing so, he must have assumed that both control consoles were in manual mode. But the starboard propulsion was still in autopilot mode, which meant that the starboard propeller held its position at 0° due to the tiller being at midships; any thrust from this propeller consequently sent the ship forward. The unintended forward thrust of the starboard propeller took effect immediately but the required sternward thrust of the port propeller was delayed due to the azimuth drive having to turn 180°.

Lessons learned

- Even when bridge team management appears to be working well there could be hidden weaknesses. In this case each person was working in his own 'bubble' and when it came time for quick reaction the Master experienced a slip – he activated the starboard propeller as if it was in manual mode.
- When working as a bridge team, practise verbalising all of your actions as this helps memory and lets the other team members know what is happening and what you are doing. In this case, had the team verbalised the mode of each propeller in the initial stages of the manoeuvre, the Master may have avoided his subsequent slip.
- Assumptions can be dangerous. Check and double check your instruments.

MARS 201633

Dangerous helicopter transfer arrangements

➔ In certain jurisdictions the use of helicopters to transport pilots to and from the vessel is becoming the norm. It has been observed that there is a lack of standard safe access between the landing hatch and the main deck of the ship, the vertical drop/climb often being many

metres. For example, instances have been encountered where there are no proper handholds, and no arrangements to fit stanchions on the hatch top or hatch side to allow for safe handholds. In these cases, the pilot must slide to the hatch edge in a sitting position and try to find the first foot rung on the coaming side. Not an easy task in any circumstance, and certainly not when the hatch lid is wet and the vessel is rolling.

In instances where handholds and stanchions are fitted, other deficiencies have been noted. Recently, while the pilot was holding the stanchions to descend a hatch coaming, both the stanchions and the stub posts into which they were fitted gave way due to severe corrosion (see below). The pilot fell backwards to the deck some 2.5 metres below. His 'flying helmet' probably saved him suffering extensive head injuries when his head hit the deck.

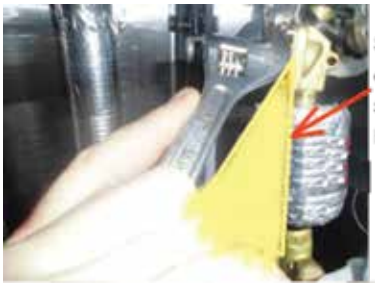
Lessons learned

- Just as much attention must be given to the detail, safety and quality of helicopter landing areas as to traditional access via the vessel's side.
- Safe helicopter access is not just an issue for pilots, but could be critical for crew or rescue workers in an emergency situation.

MARS 201634

Refrigerant spray on hand is cold comfort

➔ After provisioning the vegetable room at port it was observed that the temperature did not drop to its normal operational range. The electrician was detailed to investigate and determine the problem.



While he was inspecting the solenoid valve of the refrigeration gas lines using a wrench, refrigerant gas suddenly released and sprayed on his hand.

At first, there was no pain and the electrician did not realise the damage done to his hand due to the cold gas. Soon however, a second degree burn with severe pain manifested.

The company investigation found, among other things, that there had been a failure to complete a permit to work. The permit to work was necessary due to the fact that work was to be done on a line presenting a hazard. This first failure probably contributed to a second dangerous act, that of not wearing proper personal protective equipment (PPE), in this case gloves. Also, the normal lock-out/tag-out procedure was not followed as the inlet and outlet valves were not closed prior to the work and pressure was maintained within the lines.

Lessons learned

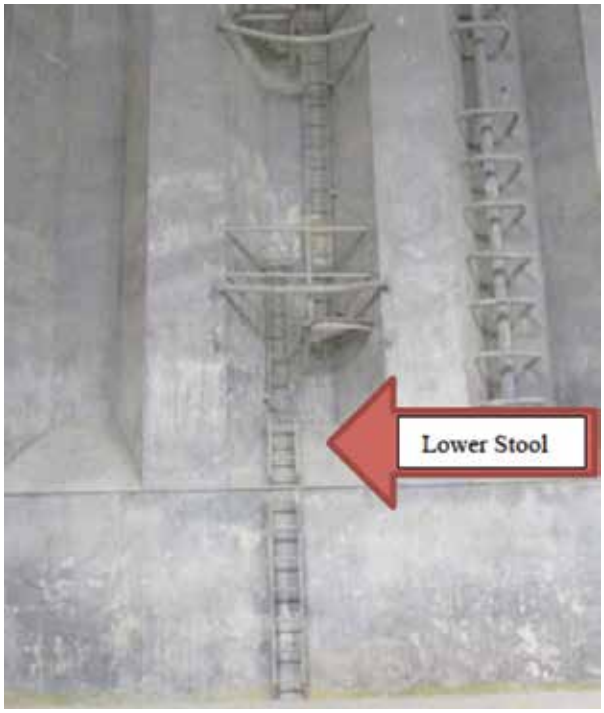
- PPE such as boots, gloves and glasses should be second nature in a truly safety conscious work environment.
- Permits to work are not just a paper exercise, but contain valuable checklists to help crew members stay safe.
- Consulting the Material Safety Data Sheet (MSDS) for the material to be worked on should become second nature.
- While every crew member is responsible for following procedures, safety leadership is also an important element in the system. In this case both sides of the equation were less than adequate.

MARS 201635

Less than adequate safety indicators for cargo hold ladders

Edited from the UK P&I Club Bulletin 1076 - 01/16

➔ Recently, a number of cases have come to light where persons have been seriously injured falling from cargo hold access ladders. It would appear that the victims involved in these accidents may have let go of the ladder prematurely, having mistaken the top of the 'lower stool' for the tank top at the bottom of the hold (see diagram below). In many large vessels, the distance between the lower stool and the tank top can be appreciable.



Lessons learned

- Warning posters at the entrance to the holds may help increase awareness of this hazard.
- Safety notifications to external parties should include a brief to stevedores on the ladder markings for safe access.
- Ladders and stools should have safety indications for the users; for example, a clear marking about four metres above the tank top should indicate the situation. Additionally, another marking about 1.8 metres from the tank top should indicate the distance remaining.

MARS 201636

Underestimated fall hazard

As edited from official UK Marine Accident Investigation Branch (MAIB) report 27-2015

➔ The vessel was berthed for loading a cargo of motor yachts. The cargo operation was organised by a specialised transportation company and was overseen by one of its loadmasters. The chief officer (CO) was acting as the ship's cargo officer and was supervising the operation in consultation with the loadmaster.

While loading the first motor yacht, the loadmaster asked the chief officer to ensure the yacht was aligned with its cradles. To do this, the chief officer went to the stern of the yacht, which was close to the unfenced edge of the hatch cover, and grabbed hold of its rudder. Once the yacht was lowered onto its cradle chocks the chief officer stepped back, but as he did so, he stumbled, lost his balance and fell 2.4 metres from the ship's cargo hatch cover to the main deck. He suffered multiple fractures to both of his ankles on impact, and was unable to return to work for 12 months.

An interesting statistic brought to light by the investigation shows that in the UK, falls from height on land are the single biggest cause of workplace fatalities and major injuries. Furthermore, over 80% of the major injuries recorded were the result of falls from heights of below two metres.

Simulation of CO position just before fall

2.4m fall

Lessons learned

- Working on the hatch covers was a day to day activity on this vessel, which may have dulled the crew's risk perception of the fall hazard presented by working close to the hatch cover edges.
- Without edge protection, the risk of falling off the hatch covers was ever present on this vessel.
- Portable safety barriers and/or individual fall protection should always be used to protect against a known falling hazard.
- Many fall injuries occur at heights that are less than two metres.

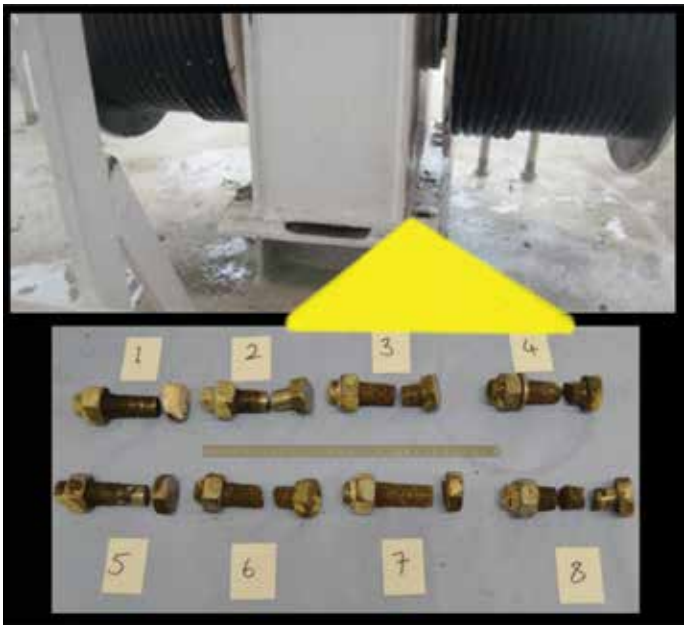
MARS 201637

Corrosion-related failure of bolts used to secure lifeboat winches

Edited from International Marine Contractors Association (IMCA) Safety Flash 22-15

➔ During a vessel inspection, a severed bolt was observed lying on deck in the vicinity of a lifeboat winch foundation plate. Further close inspection found that four other bolts out of a total of eight holding the foundation plate were also severed; these bolts were still retained within the foundation assembly by paint and corrosion.

This prompted an inspection of the winch foundation units on the three remaining lifeboats. On a second lifeboat, three out of eight bolts were detected as being severed while still held in place on the assembly by the paint coating. The remaining two lifeboat winch foundation assemblies were found to have no bolt failures.



Several years ago, a classification society casualty report identified and reported an almost identical failure of bolts. In that particular case the winch foundation failed and the lifeboat wires snapped, seriously injuring a crew member.

The company investigation found, among other things, that the bolts had been in place for approximately eight years. They had failed as a consequence of corrosion. The chromium-manganese alloy from which these bolts were manufactured was not considered a suitable material for bolting in the marine environment.

Lessons learned

- Although there was no mention of inspection or replacement routines of these bolts in the lifeboat manual supplied by the ship builder, a close-up inspection is considered prudent for such items.

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- Replacing these bolts with appropriate new stock (eg grade 8.8 Hot Dip Galvanized bolts) every five years, just prior to the quinquennial testing, is a reasonable risk reduction action.

MARS 201638

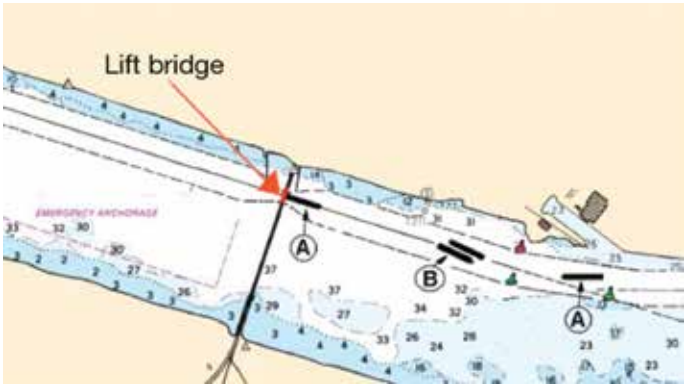
Ships passing in the night - just

Edited from official Transportation Safety Board of Canada report M08C0081

➔ In the early morning hours, in darkness and snow squalls, two ships were meeting in a narrow channel. Thirty minutes before the expected meeting, the officer piloting the up-bound vessel called the down-bound vessel to make meeting arrangements; he was to slow his vessel in order to meet below the lift bridge. The officer piloting the down bound vessel agreed, but the exact location of the meeting was not specified. Some time later, as the down-bound vessel passed through the opening of a lift bridge, the up-bound vessel was approaching a turn in the waterway (positions A in the diagram).

The officer piloting the down-bound vessel observed that the up-bound vessel's aspect seemed to indicate a starboard-to-starboard meeting. He called the up-bound vessel on VHF radio to confirm meeting arrangements. The call was delayed 10 to 15 seconds due to radio traffic, but when the up-bound vessel's piloting officer replied, he stated that they were coming to starboard in preparation for a port-to-port meeting.

Once port-to-port was confirmed, the officer piloting the down-bound vessel ordered hard starboard and increased speed to help kick the vessel's head to starboard. Meanwhile, the up-bound vessel was coming slowly to starboard. The bridge team of the up-bound vessel could distinguish some of the down-bound vessel's deck lights through the snow squalls, but Christmas lights on its bow made its aspect



Time between positions A & B: 2.5 minutes

difficult to determine. Soon after, the officer piloting the up-bound vessel ordered hard starboard and requested full ahead on the main engine to help kick the bow to starboard. The two vessels nonetheless touched as they passed each other (position B) but avoided major structural damage.

Lessons learned

- Good planning and clear communication is important, even if it is done 'on the fly'. In this case, the officer piloting the down-bound vessel agreed to meet 'below the bridge', but the exact location of the meeting was not specified. As it was, the vessels met at a location that was less than ideal given the relatively narrow channel width, the turn in the waterway, the prevailing currents, and the limited distance available to properly line up the lift bridge approach for the up-bound vessel.
- Never display lights that could introduce confusion for other vessels in respect of your navigation lights.