

June 2015

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Seaways

The International Journal of The Nautical Institute

Understanding the human factor

A straightforward guide p6

Forward looking Sonar

Pros and cons p12

Passenger evacuation

Focusing the research p21

Shipping and CSR

Meeting our responsibilities p28

At the sharp end

Rethinking risk assessment p9



Focus

Supporting professional growth

“The Seatrade Award recognises the army of volunteers who make the effort to deliver *The Navigator* onboard ships to invest in the crew’s knowledge and development.”

One of the key roles of a professional body such as The Nautical Institute, is to facilitate the sharing of ideas between professionals in order to advance of best practice for the good of the profession and society. This edition of *Seaways* certainly fulfils this goal as it is packed with excellent articles that challenge the way we do business and motivate us to seek improvements.

The human factor

Dr Nippin Anand pointedly suggests that there is not much evidence to show that risk assessments, at least in their current form, are contributing to enhanced awareness of risks in the operational environment (p9). He even suggests that many seafarers believe that the trend towards detailed and documented risk assessment in sharp end operations is merely an attempt to limit liability and blame, and then explores how to find a better model. This is neatly complemented by a summary of a raging LinkedIn debate on the use of checklists, where one contributor argues that if checklists are used as a substitute for competency, then the whole purpose is lost. How are checklists used in your organisation?

Our President, Captain Robert McCabe was asked to make a presentation to the recent Education Training and Crewing conference in Odessa (full report next month) on the subject of Human Factors (p6). Captain McCabe chose the James Reason Swiss cheese model to outline in very practical terms how the application of human factor science can help reduce incidents even before the crew come onboard. Error defences have to be put in place at all levels including at the IMO, ship and equipment designers, shore management teams, training centres, the company SMS and finally the crew onboard. If you have ever been baffled by the science of human factors, this is a very readable and common sense approach to take onboard.

Scientific development

Science is also being applied to analysing passenger ship evacuation as explained in an article (page 21) by leading researchers. The IMO has existing guidance on evacuation models and times – but are they as good as they can be? Apparently the existing guidelines

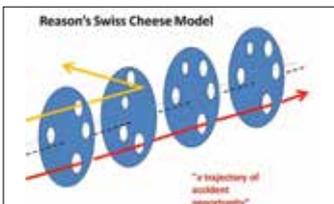
take into account neither the effects of heel and trim angles, nor fire on board. ‘Both of these conditions can have significant consequences for the evacuation process’, the authors warn. The article looks at crew involvement and even Polar Code considerations.

Polar waters also pose a challenge by tempting vessels to explore new areas made accessible by the receding ice but not yet charted. Vessels are increasingly using Forward-Looking Sonar (FLS) for this purpose and Ian Russell provides an introduction to their use (page 12). Mr Russell states that while FLS alone cannot guarantee a vessel’s safety in uncharted waters or where charting is derived from legacy hydrographic data, it can provide an important addition to the navigation suite. However, issues of training, integration with existing navigation systems and cost effectiveness are recurrent concerns.

The Navigator

We are of course very pleased to bring you another issue of *The Navigator* magazine (enclosed), this time focusing on Professional Development. The need for Professional Development will not be new to members of The Nautical Institute. However, we hope that by distributing 100,000 copies throughout the world’s merchant fleet, others can be inspired to undertake life-long learning. Steven Gosling makes a clear explanation of the NI’s formal approach to Continuing Professional Development (CPD) and its value to individuals and the industry, while senior personnel in the industry explain how CPD has benefitted them.

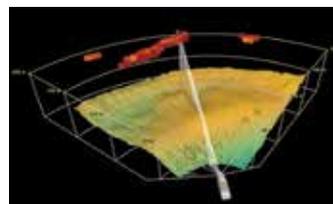
We are also pleased to announce that The Nautical Institute has been awarded the prestigious international Seatrade award for Investing in People for *The Navigator* project. The award is voted for by a panel of senior industry leaders chaired by none other than the Secretary General of the IMO, Mr Koji Sekimizu. This award recognises the army of volunteers who make the effort to deliver *The Navigator* onboard ships in order to invest in the crew’s knowledge and development. These volunteers include ship’s agents, pilots, surveyors, missions, and ship owners/managers themselves. If you would like to join this celebrated group please visit www.nautinst.org/navigator to learn how.



p6



p9



p12



p21



Mariners' Alerting and Reporting Scheme

MARS Report No. 272 June 2015

Become a reporting champion!

Have your company accident and incident reports systematically sent to MARS for wider distribution; more people will learn the lessons of safety. Of course any identifying details will be edited out of your report by our staff – we want to learn the lessons, not point fingers. Send your reports, as is, in your company format, or by using our convenient form, which you can find at: <http://www.nautinst.org/en/forums/mars/submit-a-report.cfm>

MARS 201530

Five years too long

→ One of our general cargo vessels was discharging units of wood pulp into the cargo hold of a small inland river barge using the ship's crane and a spreader. During one of the lifts (total weight of 36.6 MT including spreader) and with the load approximately 1.5 metres above the layer of wood pulp already loaded in the barge, the cargo runner wire failed 10 metres from the block. The wood pulp units landed with considerable force inside the barge along with the spreader, hook and electrical wires.

The crane in question had been inspected by a reputable classification society three weeks earlier and no defects had been found. However, both the luffing and runner wires of the crane had been installed some 10 years earlier. The certificate for the cargo runner wire (36mm, 7x34 galvanised) had a certified breaking strength of just over 1205 KN.



The crane manufacturer's manual on board states that:

The life of a rope depends on many influences. The ropes are mainly subject to internal friction and corrosion. However, a rope is to be changed after five or six years of service.

The company investigation found that:

- Rust had formed on the inner core of the runner wire;
- The wire had 4,076 hours of service use.

Lessons learned

- The yearly load test performed by the classification society and the planned maintenance system function safety test were, in and of themselves, no guarantee of the safe working condition of the crane.
- Best practice normally has wires changed after 2,500 to 3,000 working hours, or every five years at the most.
- Internal corrosion in wires is notoriously hard to evaluate. Using a metal spike during inspections to open the lay can help reveal the interior condition of the wire but even this is no guarantee of a correct assessment.

MARS 201531

Not one for the bucket list

Edited from **The Swedish Club – Monthly Safety Scenario December 2014**

→ A bulk carrier was at berth in preparation for drydocking. During the daily safety meeting the superintendent informed everyone that the ship's bucket grabs were to be taken ashore. The grabs weigh 10 tonnes each and are more than 4 metres high. A risk assessment of the operation had been done beforehand; the plan was to land the grabs in the open position onto a trailer on the quay.



On the quay were two cadets, an officer, two ABs and the vessel's superintendent. The two cadets had been instructed to help only if specifically instructed, while the ABs were to remove the wires when the grab was safely secured on the trailer.

The grabs were landed on the trailer in the open position with the bucket in a forward and aft direction as planned. As soon as the grab was landed on the trailer, one of the cadets climbed up to release the wires but was quickly reprimanded. Once on the trailer it was found that the grabs were too high to pass the height restriction at the shipyard and on the roads; it was subsequently decided to lay the bucket in the closed position and with one side resting on the trailer bed.

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The bucket was closed, then lifted and swung to stow the bucket in an athwartship direction. Once the grab was on the trailer and apparently stable, the cadet, unseen by the others as they were preoccupied at other tasks, once again climbed up on the grab to release the two hoisting wires from the crane. Once he removed the hoist from the grab, the cadet released his safety harness to descend, securing a rope to the top of the grab instead to assist him while climbing down.

Although the grab appeared to be stable it was in fact slightly top heavy in the closed position. As the cadet was climbing down the rope, the grab suddenly shifted, falling into the water, and dragging the cadet with it. A lifebuoy was thrown in the water and the cadet retrieved. He was later diagnosed with serious injuries and internal bleeding.

Lessons learned

- A risk assessment had been done but the plan was subsequently changed. A reassessment of risks would have been appropriate.
- Notwithstanding the initial risk assessment and assignment of tasks, the cadet, although well meaning, was impetuous in his actions. Many accidents have happened in the past because of the 'can do' attitude of undisciplined crew.

MARS 201532

A slip that has good results

➔ One of our tankers in ballast went to anchorage with winds at F4. Winds subsequently increased to F6/7 and the vessel began dragging. The crew weighed anchor and then re-anchored, but to no avail as they continued to drag with six shackles out.

Meanwhile, another tanker anchored nearby had also started to drag anchor and was approaching their vessel, now at 0.3 nm. As the crew tried to heave anchor once again they noticed that their anchor appeared to be fouled with the ground tackle of the second tanker. As the vessels continued to close, now at 0.15 nm, the crew on our vessel slipped their anchor at the bitter end and manoeuvred away from the second vessel without further incident.

The anchor was retrieved four days later and re-installed on the vessel.

Lessons learned

- In strong winds, it is often a better strategy to drift outside an anchorage especially if an initial attempt at anchoring has proven fruitless.
- Slipping an anchor at an anchorage to avoid damage from collision or other sources can be a prudent move. The cost and possible consequences of collision or other damage are usually greater than those associated with recovery of the anchor and chain.

■ **Editor's comment:** Go have a look at your vessel's bitter end. Is it an easy job to slip?

MARS 201533

Five deaths in a tank

➔ A 'largo' pontoon was beached at an isolated location for repairs. At one point the person in charge of the pontoon entered a compartment approximately five metres deep; there were no checks on the air quality of that compartment before entry. Within a very short time after entering this tank he became unconscious and fell, face down, onto the plates below. One of the two co-workers that had remained outside attempted a rescue and was also rendered unconscious after entering the tank. A third worker then entered the tank and also succumbed.

Seeing the commotion and wanting to help, a man on the beach also entered the space to carry out a rescue and he too became unconscious. In short succession two others entered the tank but also succumbed. After more than an hour a successful rescue attempt was made and all bodies were removed. Resuscitation was attempted at length but of the six who entered the compartment, there was only one survivor.

Lessons learned

- A false sense of security may have been acquired by the person in charge as he had entered other tanks earlier without negative consequences.
- Never enter a confined space without first testing the atmosphere from top to bottom.
- Always wear a portable four-gas detector while in a confined space, even once it has passed the initial testing prior to entry.
- Confined space training and practice is essential in order to prevent tragedies such as the above.

■ **Editor's note:** While the barge in question was not a SOLAS convention vessel, the workers would have benefited from proper training and awareness of enclosed spaces. Since January 2015, enclosed space entry drills and practices are required every two months of SOLAS vessel crews.

MARS 201534

Dangers of dropped objects

Marine Safety Forum – Safety Flash 15-01

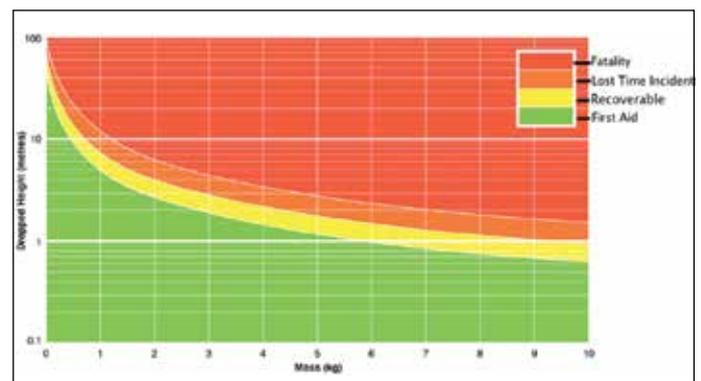
➔ A support vessel was carrying out operations. Due to the heading in relation to the prevailing seas and swell the ship was reported to be 'slamming'. This movement caused a piece of timber approximately 300mm x 100mm to fall 15 metres from the crane jib support to the deck below. The piece of timber was not a loose item that had been displaced, but was in fact a section of the jib stowage arrangement which had apparently split and come loose from its support.

Subsequently, the vessel crew completed a full and thorough HSE inspection of all deck areas to check for other weak points and also to ensure there were no remaining loose/unsecured items which could fall onto decks or spaces below. All personnel on board were reminded to remain vigilant for the possibility of falling objects.

Lessons learned

Estimating the wood weighs 3 to 4 kg, the Dropped Object Calculator below shows that the consequences of it hitting someone from 15 metres could be potentially fatal.

Every crewman should be made aware of the potentially fatal or debilitating effects of dropped objects. The Dropped Object Calculator is a valuable tool for training and awareness.



MARS 201535

Bent bolt squeezes finger

→ In preparation for a maintenance job by an outside contractor, the chief engineer (CE) and an assisting crew member were to remove some stainless steel bolts and their associated 'nylock' nuts from a piece of deck equipment. Before starting the job, the CE conducted a toolbox talk on how they would proceed with the job.

The assisting crew member was holding the pneumatic rattle gun, which was attached to the bolt. The CE was attempting to locate the socket; he was kneeling down and could not see the location of the socket, so he was trying to line up and grip the 'nylock' nut by feel. Meanwhile, another job was being undertaken on deck nearby and may have caused some distraction.

As the CE was locating the nut using his fingers (without gloves) he apparently gave the signal to the crew member to activate the pneumatic rattle gun. The crew member squeezed the trigger and the moving bolt crushed the CE's finger against the recessed sleeve in which the nut and bolt were housed.

The subsequent investigation found that the bolt was bent, which was unknown to the crew performing the job. Had the bolt been straight the consequences would have been less severe or nonexistent.

Lessons learned

- The activity on the deck caused by another job being simultaneously undertaken could have been distracting, acting as a barrier to communication for the two men.
- The CE was not wearing gloves, which could have reduced the severity of the injury.
- Whenever possible use tools instead of fingers.
- Pneumatic tools reduce the need for manual labour and limit repetitive strain injuries. However they can also increase risks to the user and those around them due to the energy delivered. When using pneumatic tools or other energy storage devices, crew should be aware of the risks.

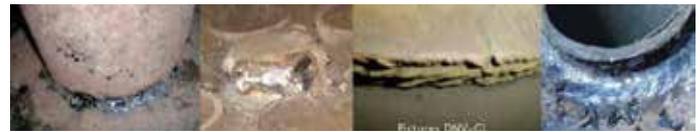
MARS 201536

Avoiding boiler blowups

Edited from Norwegian Hull Club – Casualty Information No 95

→ Boiler explosions and defects, although not common, do happen from time to time and have the potential for very serious consequences.

For example, testing of the boiler water should be a scheduled maintenance task and samples forwarded to specialists. Their feedback and recommendations should be carefully considered and followed up. The energy released in a boiler explosion is tremendous and poor boiler treatment or boiler repairs can be catastrophic. When repairs to the boilers are required, always use specialists as improvised repairs by a non-specialist are rarely to specifications.



For example, welding gives high heat input; too much heat will change the material properties of the steel (furnace, steam drums, tubes). Never attempt to gouge out and re-weld cracks in boilers. Heat damaged material, including welds, should be repaired by inserts. The size of inserts should be sufficient to keep the heat affected zones of the individual welds apart. Again, this speaks to hiring boiler repair specialists and involving your classification society.

Lessons learned

- Ensure the engine crew maintain the boiler as per manufacturer's specifications.
- A clean, well maintained boiler has little or no fouling. As fouling increases, so does heat transfer and so boiler degradation.
- Always use specialists for steel repairs to boilers.
- Ensure class approval for any repairs to boilers.



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The Mariners' Alerting and Reporting Scheme (MARS) is primarily a confidential reporting system run by The Nautical Institute to allow full reporting of accidents (and near misses) without fear of identification or litigation. As a free service to the industry, MARS reports also regularly comprise alerts condensed from official industry sources, so that issues resulting from recent incidents can be efficiently relayed to the mariner on board. With access to the internet from vessels becoming more affordable, the MARS database is a valuable risk

MARS needs you!

Reports from mariners' experiences of incidents and near-misses are one of the most valuable tools the shipping industry has to help prevent such incidents in future. But The Nautical Institute can only share these incidents if they are reported to us in the first place. www.mars.nautinst.org

Visit www.nautinst.org/MARS for online database

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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NI Nautical Affiliates

The Nautical Institute has launched a new Nautical Affiliate scheme through which your organisation can demonstrate its support for our charitable work to improve safety, efficiency and best practice within the maritime industry. Your generous support will be used exclusively to fund our Mariners' Alerting and Reporting Scheme (MARS). The scheme replaces the Institute's previous Corporate Affiliate and MARS Sponsorship schemes.

For an outlay of just £500 a year, organisations that join us as a Nautical Affiliate enjoy a wide range of benefits, including:

- Public acknowledgement of the organisation's support for a key industry safety initiative – our Mariners' Alerting and Reporting Scheme (MARS).
- Heavily discounted membership fees where three or more employees become members of the Institute – in turn providing them with access to a robust CPD programme, networking opportunities, monthly members' journal, professional recognition, etc.

- A discount of up to 40% when buying our specialist books and guides.
- Sizeable reductions in delegate fees for leading industry conferences, thanks to the negotiating power of the Institute.

To find out more simply contact Nautical Institute Chief Executive Philip Wake MSc FNI at cpw@nautinst.org or call him on +44 (0)20 7928 1351. Further details can also be found online at www.nautinst.org/affiliate or through scanning the QR code.



For more information about our Mariners' Alerting and Reporting Scheme (MARS) please visit www.nautinst.org/MARS

MARS is only possible because of the support of our Nautical Affiliates.