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Seaways

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The way forward

AGM 2013

The Nautical Institute

Philip Wake MSc, FNI Chief Executive

Focus

Scanning the future – Dealing with the present

> A true safety culture can be created but it takes leadership from the top and investment in people plus the use of those good old fashioned techniques of teamwork and mentoring.

This month we have the pleasure of reporting on the first AGM of the Institute to be held in South Asia and it is an understatement to say that the Sri Lankan Branch did a superb job in organising the whole Event (see pp 5-12). It consisted of a seminar on 'Marine Administration …..Where at? Where to?' with a focus on the needs for and of future administrators. It continued the Generation Y theme of last year's AGM Event, but switched the attention to a specific career opportunity ashore. It was therefore particularly important that some 70 cadets and midshipmen from Colombo's ten training colleges were present due to the generous support of the principal sponsor, Avant Garde Maritime Services, and many other companies. These smart young people were also very helpful in assisting the organisers throughout the seminar and we have no doubt they will be a credit to the maritime industry as they progress in their careers.

As can be seen from the seminar report, some excellent presentations led to healthily robust discussions in the open forums, resulting in a set of resolutions which we hope will aid marine administrations and the IMO to address the future with a clear vision. It was very clear that there are challenges in attracting and retaining the right calibre of professionals to these roles in many countries, and it was felt that other regions should run similar seminars to explore and address these aspects.

The present

The importance of getting marine administration right is underlined by the Captain's Column this month and it should be required reading for all those ashore involved in the control of sea-going ships (see p 4). Captain Dermen takes a very realistic look at the safety regime imposed on seafarers and exposes a number of the flaws in it – not least the flood of paperwork. Yet he also acknowledges that the current fleet is younger and has a better safety track record than that of the 1980s and 1990s due to technological advances. The relative youth of the fleet is hardly surprising given the massive orderbook of newbuildings generated by the shipowners' and banks' predictable over-reaction in the boom years of the early 21st century. History repeating itself comes to mind. However, does a young fleet also mean a safer fleet? Sadly, the rising trend in casualties and insurance claims points in the opposite direction. Such fleets usually operate in a depressed market when cashflow is tight and this fleet certainly is in such a market. The first budgets to be cut at such times are training and maintenance, so the human factor and human element causes of accidents come to the fore again. A true safety culture can be created but it takes leadership from the top and investment in people plus the use of those good old fashioned techniques of teamwork and mentoring.

The future

It could be argued that the seafarer's days may be numbered due to the unremitting march of technology taking on more and more roles previously done by 'seafarers of the sextant age' as Captain Dermen labelled those of us of a certain age. David Patraiko, who leads for the Institute at many 'blue sky thinking' conferences looking far into the future, considers the advent of the driverless ship (see pp 13-14). Unarguably, such craft already exist in certain specialised roles but are still controlled by a manned control centre. If this technology is eventually made use of in the commercial shipping world various control scenarios might be utilised, one of which envisages experienced mariners manning control centres ashore. Now that would solve the anti-social life style problems of seafaring and may be considered a brave new world! Before Generation Y gets too excited by this prospect, David's assessment highlights many significant obstacles in the way of this vision becoming reality – not least the level of investment required and the need to rewrite all the maritime conventions and laws which are predicated on manned vessels.

Mariners' Alerting and Reporting Scheme

MARS Report No. 249 July 2013

MARS 201338

Stopper pin – when two is one too many

➔ While the vessel was in dock, the bosun and an assistant carried out adjustment work on the windlass. After completing the job they intended to disengage the clutch by shifting the clutch lever. The bosun removed the stopper pin for the lever and instructed his assistant to shift the lever, which the assistant did (after first confirming all was clear and getting a confirmation back). However, the bosun's finger was still positioned between the edge of the clutch lever and the stopper plate. As the assistant swung the clutch lever the bosun's finger was crushed as the lever approached its end position. The victim sustained several superficial lacerations, a distal edge nail laceration and a fractured finger joint. He was treated with sutures and application of a prosthetic nail after surgical nail-bed repair.

The accident occurred at the end of a hard day's work so fatigue may have played a part. Neither the bosun nor his assistant were aware the bosun's fingers were in harm's way.

■ **Editor's Note:** This seemingly simple task still resulted in an unfortunate and rather serious accident – surgical nail bed repair is nothing to joke about. The two crew seemed to be communicating well enough but they both had less than adequate situational awareness. This company should be praised for identifying fatigue as a possible contributing factor – fatigue should always be considered until it can be shown not to have been a factor. It may be of interest however that from a formal investigative standpoint, fatigue is usually identified by documenting work and rest over a period of 72 hours or more, not just one day.

More importantly, had the bosun or his assistant accomplished this task alone, no injury could have occurred. If the same person first removes the pin and then throws the clutch lever their fingers cannot be in harm's way. Of course, hindsight is 20/20 but this nonetheless highlights the advantages of carefully evaluating each task to be accomplished before acting.

MARS 201339

Emergency air compressor fights back

➔ An engineer was carrying out routine inspection and maintenance on the emergency air compressor including a start test. When starting the compressor by manually cranking, the engineer failed to remove the handle before the engine reached its self-ignition RPM speed. As a result, the handle was thrown off the crank engagement nub when the compressor began turning over on its own, hitting him in the face. The engineer suffered two chipped teeth and lacerations of his lip.

The vessel's investigation determined that the engineer was not fatigued at the time of the task. Additionally, he had carried out the same starting operation a number of times in the past.

The compressor starting procedure was apparently followed during start-up, covering items such as leaving the compressor drain valve opened and operating the engine de-compression lever at the time of testing.

Action taken

- Suitable caution notice should be displayed near the unit to remind the operator of the danger.
- The operator should receive specific training and be made aware of this danger when joining the vessel and before he/she carries out this test for the first time.
- The operator should be positioned suitably and firmly and pay full attention at the time of crank-starting the compressor.

■ **Editor's Note:** If all procedures were truly followed during this task yet this accident still occurred, the residual risk would appear to be somewhat high. In that case, it may require a re-evaluation of the fundamental design or of the PPE necessary to accomplish this task, such as requiring a full face mask much like wood cutters in the forest industry.

MARS 201340

Risks of dropping the anchor underway

Official report edited from The Dutch Safety Board

➔ In calm weather and good visibility, a cargo vessel under pilotage while departing port was overtaking a tug towing a pontoon. The cargo vessel's electrical needs at the time were being supplied via the shaft generator. Both of the ship's service generators were shut down to save on fuel.

While overtaking the pontoon, the cargo vessel's main engine

suddenly failed. Since the electrical systems on board the vessel were linked to the main engine via the shaft generator, the electricity failed as well and for a short period of time the vessel suffered a blackout. During the blackout, the rudder unexpectedly turned to port, causing the vessel to deviate sharply from its course and toward the tug and tow. In order to prevent a collision, the captain, on VHF radio, ordered the anchor let go. As there were crew on deck at the time, the anchor was let go very quickly after the order – within 15 seconds. At the time the anchor was let go the cargo vessel still had a speed over ground (SOG) of 7.5 knots.

Despite the attempts by the AB to secure the winch brake, the anchor chain continued to run out. The last length of chain had broken loose from the chain locker, and the AB was hit and fatally injured by the bitter end.

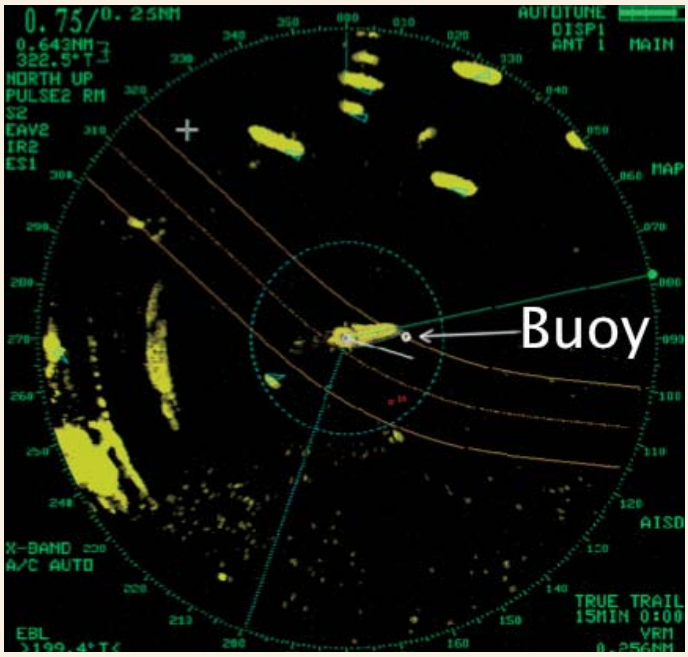
The cargo vessel collided with the pontoon almost simultaneously with the breaking free of the anchor chain. Both vessels sustained limited damage as a result of the collision.

Simulation of A/B attempting to secure the brake as the chain ran out

Lessons learned

The use of the anchor to slow down the ship in an emergency: IACS stipulates that an anchor must be constructed in such a way that it is suitable to anchor a ship temporarily in 'moderate' ambient conditions. The anchor gear is not designed to stop a ship. Anchoring at high speed is an extremely risky operation that may result in fatal injuries to crew members and serious damage to the ship. Such a manoeuvre should only be considered in an extreme emergency. The captain, in consultation with the bridge team, should assess whether the potential benefits of such a manoeuvre outweighs the substantial risks for the crew and ship.

The need for uninterrupted power supply when sailing in confined waters: Sailing in narrow waters entails increased risks of collision or grounding. Therefore, prior to commencing a passage in confined waters, a risk analysis should be carried out (or consulted) as part of the SMS in order to verify that back-up systems are instantly available. Uninterrupted power supply in confined waters is essential in order to guarantee a ship's manoeuvrability and should be considered a best practice.



MARS 201341

Steering failure? Think NFU

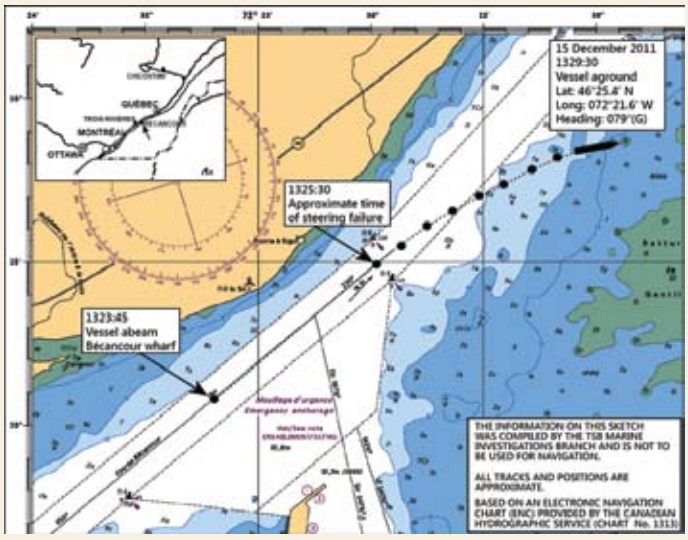
Official Report edited from TSB (Canada) M11L0160

➔ The vessel, under pilotage, departed port in ballast and was down bound in a restricted waterway. The engine control was set to bridge control and a helmsman was using manual full follow-up (FFU) steering.

At one point a port alteration was requested; however, the rudder angle indicator showed 10° to starboard. Several port and starboard helm inputs were attempted with the FFU but no rudder movement could be observed on the rudder angle indicator. The pilot then ordered the engine to be stopped and that the anchor be readied.

The Master arrived on the bridge just as the vessel was leaving the buoyed channel. He went directly to the steering stand and transferred the steering system actuator switch from the port system to starboard system. This action restored control to the steering but it was too late. The vessel ran aground at an estimated speed of 8 knots over the ground.

The vessel is fitted with a very typical steering control system where a control mode selector switch is used to select one of three different means of steering the vessel: autopilot, hand (FFU) or non-



follow-up (NFU). The helm order data signal to the steering gear telemotors is provided by two potentiometers that are mechanically linked to the helm wheel and electrically linked to each telemotor: one potentiometer per telemotor. It was later discovered that the port system helm follow-up potentiometer had failed, rendering the FFU useless until the starboard system was belatedly selected by the Master.

Typically, when the NFU mode is selected, the NFU controller becomes operational and the helm wheel is deactivated. Additionally on this vessel once the NFU controller is used, it overrides all other steering controllers without the need to set the steering mode selector switch to NFU. The NFU controller is a spring-loaded lever that must be held to one side or the other for a signal to be sent to the steering gear telemotors.

Alternative steering methods

Subsequent to this accident the TSB conducted a review of vessels from different owners and flag states to determine the general knowledge and use of the NFU mode by bridge crew members. Although from a statistically small group, it was nonetheless found that 75% of crew surveyed were not fully familiar with the use of the NFU mode. Generally, familiarisation for helmsmen on joining the vessel included brief explanations of the different steering stand components and their use, including the NFU mode. Furthermore, the procedures for dealing with situations involving steering failures refer primarily to the local emergency steering in the steering gear compartment. Use of the NFU mode, if it is referred to, is usually listed as a secondary or tertiary method to regain control.

When the bridge team became aware that the rudder was not responding, three options were available on the bridge to rectify the situation:

1. taking over the steering control with the non-follow-up (NFU) mode,
2. changing over from the port to the starboard steering system to also regain steering control, or
3. stopping the vessel.

However, stopping the vessel was not a viable option because of the vessel's proximity to the shore and the length of time required to put the engine at full astern and stop the vessel and or anchor effectively. Thus, while in this case the engine was ordered full astern, the engine went astern only after the vessel had grounded and before the anchor could be deployed.

The other two options in this situation involved regaining control of steering. There was no attempt made by the OOW or the helmsman nor order by the pilot to use the NFU mode or to switch from the port to the starboard steering system. By the time the Master returned to the bridge and switched the steering system selector switch from port to starboard, restoring control of rudder movement, it was too late to prevent the grounding.

Some of the findings of the official report

1. Without the regular replacement of potentiometers, there is an increased risk that they will fail in service.
2. Crew may be unfamiliar with the steering control methods of the non-follow-up mode or switching steering systems in cases of steering failure if this information is not incorporated into technical manuals, familiarisation, and drills, or adequately described and posted near the steering stand.

■ **Editor's Note:** A steering malfunction in the middle of the ocean is not a problem – you have lots of time and there are no hazards. But typically, in restricted waterways you only have a minute or two to resolve the steering issue before unwanted consequences are suffered.

Many reports and surveys have shown that crew are not instinctively switching to NFU when a steering failure in FFU mode occurs – yet this should be their first reaction. Switching steering systems (port to starboard or vice versa) is also a procedure that takes only a few seconds and could save the situation.

MARS 201342

Some surge protection devices unfit for vessels

Official Safety Alert from United States Coast Guard: Alert 03-13b


Typical Home SPD

➔ Most commercially available surge protection devices (SPDs) are designed for use ashore and will interrupt only the hot conductor when a surge occurs. What does that mean for the ship owner/operator? It means that while these devices may provide protection in our homes and offices, these same devices may be a fire risk onboard vessels.

A marine casualty investigation of two separate stateroom fires revealed that the sources of the fires were attributed to the use of SPDs plugged into a lighting circuit. It was discovered that a ground had developed on another circuit that was connected to the same distribution panel providing power to the staterooms. This ground created an imbalance of voltage between the two power conductors supplying the SPDs which caused excessive currents, overheating, and subsequently, a fire. In this instance, even if the SPDs automatically tripped as designed, only one power conductor would have been secured while the other would continue to provide power, possibly shorting to the device's ground wire and the structure of the vessel.

For shipboard applications, it is critical for a device to interrupt both power conductors.

Vessels should have defined procedures for checking the condition and grounding capabilities of personal/portable electrical equipment, and trained shipboard personnel should be assigned to check and approve all SPDs in use or brought on board for compatibility with the vessel's electrical distribution system prior to use.

Additional technical information

- This safety alert only applies to vessels with alternating current power systems.
- There is no official Underwriters Laboratory standard for Marine Surge Protective Devices despite numerous retailers advertising 'UL Marine 1449'.

An SPD should be

- only permitted for use onboard once approved by a trained crewmember;
- removed from service if it is hot to touch;
- unplugged when not in use;
- regularly inspected for damage or wear;
- limited to one SPD per single duplex receptacle outlet and never daisy chained;
- prevented from use in excessively humid or moist environments;
- provided air circulation and not covered with carpet or other items, and
- checked to ensure that all plugs are fully engaged.

MARS 201343

Get a good grip

Official Report edited from BSU 415/10

➔ During operations, an O/S climbed onto the 2.2 metre hatch coaming and used the guard rail for foot support. Presumably, as there were no direct witnesses, he lost his footing and/or handhold, fell backward

onto the deck and struck the guard rail with his head causing fatal injuries. He was wearing size 10 mixed fabric (cotton/rubber) gloves and a protective helmet. An examination of the work rest schedule of the victim did not reveal fatigue as a factor.

No ladder was located in the immediate vicinity of the accident; there were only three permanently installed ladders along the whole of the hatch coaming. It would have been possible to safely stand on the hatch coaming with such a ladder as an additional handhold and backfall preventer is offered by the rail above each ladder.

The official BSU report found that the accident was the result of structural defects and inappropriate protective equipment, amongst others. Had more ladders been installed on the hatch coaming then it is very likely that the accident would not have happened because controlled operation with additional protection (in this case, a backrest on the coaming) would then have been possible.

Additionally, it is possible that the accident was facilitated by gloves which were too big and inappropriate for the intended use. When assessing the gloves, the BSU found that the size 10 was a very large fit and that hands could easily slip out. The gloves were also without a non-slip coating such as provided by 'gripper dots'.

A protective glove suitable for all activities on board does not exist because the spectrum of applications is too wide. In this case, it was noted that only one glove type had been made available, and only in size 10, for all the shipboard activities. Gloves should be fit for service and be supplied in the right size so as to provide a snug fit.

■ **Editor's Note:** Although the BSU report specifies that the victim was wearing a protective helmet at the time of the accident, the report remains silent on whether the helmet had been secured with a chinstrap to keep it firmly in place. Unfortunately, in my experience, chinstraps are rarely used. Yet, in order to help prevent injuries such as the one in this accident, the helmet must be held firmly on the head at impact. This can only be done by both correctly adjusting the head size ring to be snug and using a firmly cinched chin strap.

Scene of the accident (simulation)

Permanent ladder with backfall protection

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You can save a life, prevent injury and contribute to a more effective shipping community.

Everyone makes mistakes or has – or sees – near misses. By contributing reports to MARS, you can help others learn from your experiences. Reports concerning navigation, cargo, engineering, ISM management, mooring, leadership, design, training or any other aspect of operations are welcome, as are alerts and reports even when there has been no incident. The freely accessible database (http://www.nautinst.org/mars/) is fully searchable and can be used by the entire shipping community as a very effective risk assessment, loss prevention and work planning tool and also as a training aid.

Reports will be carefully edited to preserve confidentiality or will remain unpublished if this is not possible.

Editor: Captain Paul Drouin AFNI

Email: mars@nautinst.org or MARS, c/o The Nautical Institute, 202 Lambeth Road, London SE1 7LQ, UK

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