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Seaways

The International Journal of The Nautical Institute

Lessons for the future

Rethinking training for today's industry p 7

The Nautical Institute

Philip Wake MSc, FNI Chief Executive

Focus

Masters' Advice

> End users have an important role to play in ensuring that the systems built into ships are fit for purpose. A key role of the Institute is to encourage and facilitate this process.

With the publishing of the Third Edition of *The Nautical Institute on Command* book, Chief Officers aspiring to command and Masters newly promoted have a handy resource to help and guide them (see p 4). The 47 contributors were tasked to pass on their knowledge and expertise by imagining a 15 minute conservation in mentoring style to address that often heard comment 'I wish I had known that before I took command'. We encourage companies to make use of this book in developing their officers for promotion and it would be a useful addition to all ships' libraries as older Masters and indeed all officers would find useful knowledge within it.

Similarly, Captain Sylvie Buret contributes pertinent advice to Masters about Port State Control (PSC) inspections. The multitude of inspections and audits that ships' staff have to contend with these days is well known and should be better controlled and coordinated. However, PSC has played a valuable role in ensuring that IMO Conventions are applied properly to improve safety and protection of the marine environment as well as checking on the effective implementation of the MLC 2006. That said, any inspection can be a daunting prospect, particularly one that has the power to detain the ship, so proper preparation for them is both sensible and essential. Captain Buret's advice is concise and to the point but should not be viewed as comprehensive due to the limitations of space in the Journal (see pp 21-22).

E-Navigation update

Over the past eight years there have been many articles and conferences about e-Navigation as it has gradually progressed on its journey from a conceptual idea originating within the IMO to clearer definitions and test beds for parts of the 'system'. There have been building blocks along the way such as ECDIS, and some people still confuse various items of electronic equipment with e-Navigation. Nick Lemon's update is therefore timely and will hopefully provide clarity in the minds of readers on the direction this ambitious project is taking (see pp 10-11). He continues to identify the importance of end user input to the design processes in e-Navigation. It has always been the intent of the Institute to ensure that this is provided. We have been fully engaged in this task from the beginning through IALA and the IMO, as well as speaking and writing about the concept worldwide. We hope this has helped to raise the awareness of the aims of e-Navigation on the one hand and more importantly what the end users, ie our members and other seafarers, want it to deliver for them on the other. Having originated the idea for a standardised mode (S-Mode) in integrated navigation systems, we are pleased to report that it is in place as a deliverable of the System Implementation Plan (SIP) agreed by IMO member states, but of course it still requires serious research funding to take the concept to the next stage.

End users really do have an important role to play in ensuring that the systems built into ships are fit for purpose. Too often in the past, and it is no doubt still happening today, new equipment has been retrofitted wherever there is space and a power supply for it. Even new bridges may not be carefully designed with the end user in mind and ergonomic principles applied. It is good to see Captain Gennadiy Dzhydzhula contributing his ideas on how the bridge layout could be improved based on his experience (see pp 12-15).

A key role of the Institute is to encourage and facilitate the process of considering what can be improved and sharing those ideas with others as well as taking the collective input to the relevant authorities. The Command Seminars last year were very much part of this process on the subject of Navigational Competence and we were pleased that the US West Coast Branch chose a conclusion of those seminars to be debated at the AGM Event in San Francisco that they so successfully hosted (see pp 7-9). Closing the gap between the rapidly increasing and changing technology and the training of seafarers is not going to be easy and deserves our focused attention if the current and future generations of STCW trainees are not to be seriously disadvantaged.

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Mariners' Alerting and Reporting Scheme

MARS Report No. 273 July 2015

MARS 201537

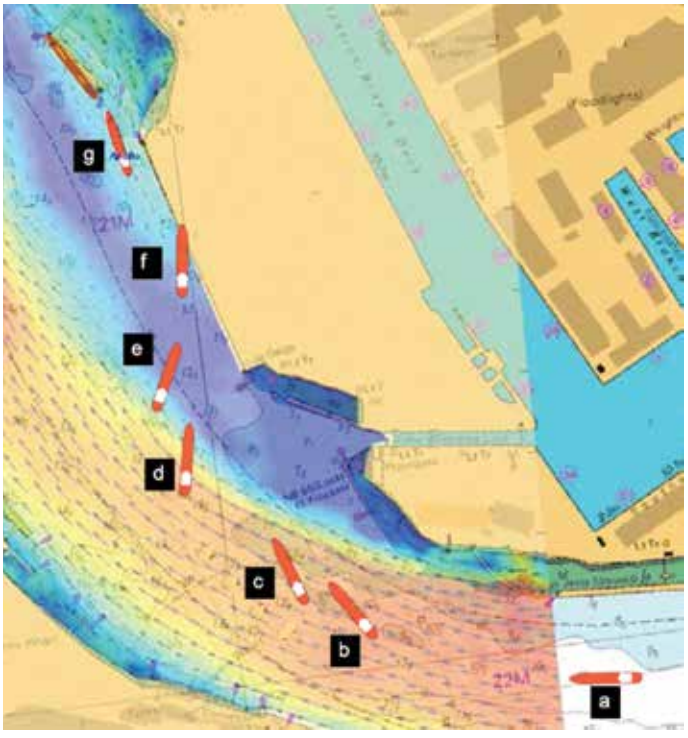
Poor Master/Pilot exchange gives poor results

Edited from UK Marine Accident Investigation Branch report 15-2014

➔ An inbound vessel in a tidal river was boarded by two pilots. The Master/Pilot exchange took place between the Master and the pilot who was to con the vessel. The pilot explained his port pilotage plan and the intended use of two tugs to assist the vessel to berth. The pilot asked the Master about the vessel's manoeuvring characteristics and was informed that the bow went to starboard when going astern, but was not told that the vessel had a cotrollable pitch propellor drive (CPP). He then countersigned the vessel's pilot card. At that point the Master left the bridge, leaving the pilots with the OOW.

After about four hours pilotage, tugs were ordered in preparation for berthing. The vessel was approaching a starboard turn in the river, with a flood current astern, when the pilot ordered the helm to starboard 15°. Within 30 seconds the vessel's rate of turn was 25°/min to starboard. Soon afterward, as the vessel was rounding the turn the pilot ordered the engine stopped (point C in diagram below); for just over 30 seconds the engine was at stop before dead slow ahead was ordered. However, the vessel's head was still swinging rapidly to starboard.

The pilot ordered full ahead, hard to port (point D) and requested one of the tugs to assist. The vessel was about 100m from the shore when its bow began to turn to port. The Master had just returned to the bridge and he repeated the order of full ahead, hard-to-port. Shortly thereafter the pilot ordered full astern, but the vessel's starboard bow made contact with the quay nonetheless at a SOG of 6.0 knots.



Lessons learned

- The pilot was unaware that the vessel was equipped with a controllable pitch propeller (CPP) drive.
- Although indicated on the pilot card, the reference to CPP was not easy to find on the form. The format of the card was poor in comparison with the layout considered best practice, such as that outlined in the International Chamber of Shipping (ICS) Bridge Procedures Guide.
- When a vessel fitted with a CPP is moving ahead and the pitch is set to zero, the flow of water through the propeller and across the rudder is interrupted and steerage will be adversely affected.

MARS 201538

Sloppy navigation leads to bottom contact

➔ During daylight hours, a small general cargo vessel was en route for discharging in good weather and visibility. The vessel (and crew) had often taken this same route but on this day, with the Master's consent, they deviated from the original track as described in the voyage plan in order to save time.

However, the voyage plan was not updated at the time and the Master and officers improvised based on local knowledge. Additionally, the officers did not bother to erase the old course lines, resulting in many confusing lines on the chart. At the watch handover the deviation from the original track was discussed and the relieving officer had no problems with this deviation. The new track would lead the vessel north of a wind farm and also north of some shallows.

A little later the OOW had to alter course to starboard due to an approaching vessel. The vessel then met a number of vessels under sail so the OOW again altered to starboard. Since he was navigating principally by visual means the OOW did not appreciate how close the vessel was coming to the shallows on its starboard side. He was aware of the existence of the shallows, now straight ahead, but he had the

impression that he would pass their outer limits with a charted depth of about 10.0 metres. The OOW also knew about squat, but he assumed that an under keel clearance (UKC) of 0.7 metres would be enough to pass the shallowest part without a problem. Unfortunately, as they passed over the shallows the vessel touched the bottom twice.

The vessel had to enter dry dock for repairs; there was paint damage and some scratches up to frame 88. Tank number 4 was taking water and there was damage to the propeller blades. Some cracks were also found in the rudder.

Lessons learned

- By deviating from the original course the vessel was brought into a potentially busier area where more yachts and pleasure craft could be expected.
- It is better to navigate by instruments, even in fine weather, than by 'impressions'.
- By reducing speed, the time available to take action would be increased, the CPA with the nearest sailing boat could have been increased and the squat would have been reduced. Unfortunately, the OOW did not avail himself of this option.
- Always use a chart which is in a good and updated condition. Old and non-used course lines must be erased.
- Trying to find short cuts in order to save (some) time is not a valid argument. The primary concern must always be the safe navigation of the vessel.
- If an ad hoc deviation is made, the voyage plan should be adjusted accordingly.

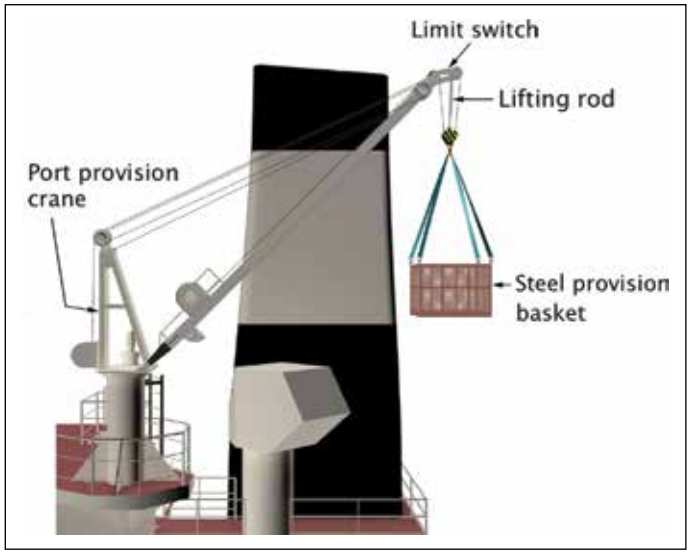
MARS 201539

Not a personnel basket

Edited from official Canadian Transport Safety Bureau report M13L0055

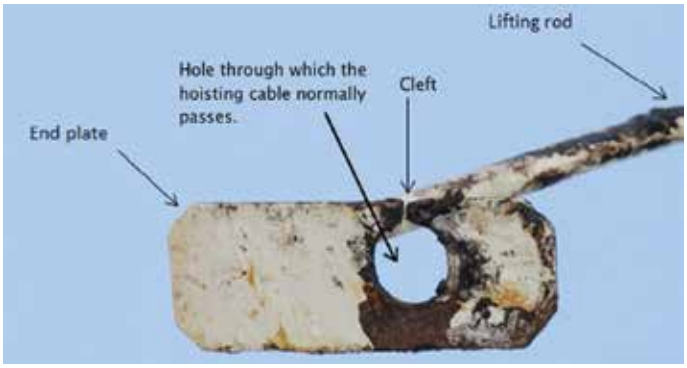
➔ Crew were performing maintenance work at a protected anchorage. The bosun and the chief officer discussed painting a portion of the port engine room vent that had recently been repaired. In the early afternoon, the bosun took the initiative to begin this job alone. He entered the steel basket attached to the port provision crane, attached his safety belt to the crane's hook, then used the remote control to operate the crane and manoeuvre the basket to the engine room vent.

After working for some time, the bosun again used the remote control to manoeuvre the basket down in order to take a break. A nearby officer heard the sound of liquid spilling; it was paint coming from the basket that the bosun was manoeuvring towards the deck. As the officer walked towards the spot where the paint had spilled a snap was heard. He looked up and then stepped back at the same moment the basket containing the bosun came crashing down approximately five metres, landing directly in front of the officer. Immediately following the accident, the crew members removed the bosun from the basket and administered first aid but he was later declared deceased.



Some of the findings of the official report, as edited, were:

- Although the crane was not suitable for lifting personnel, it was nonetheless being used to work aloft.
- Although bench tests showed the limit switch to be operating normally, it did not cut power when the crane block exceeded the set limit. Most probably the lifting rod and wire were not properly rigged; the cable not fitted through the hole in the lifting rod's end plate. In this situation, the unsecured lifting rod would have been pushed aside by the crane block, rather than up, and the limit switch would not have been activated.



- The bosun's view of the crane block was obstructed from the position inside the basket, limiting the bosun's ability to identify that the block had exceeded its set limit.
- The crane block made contact with the underside of the boom and the winch continued to pull, causing the hoisting cable to part and the basket to fall approximately five metres.

Lessons learned

- It is very tempting to use a provision basket to transport crew to hard to reach maintenance areas. But, if the basket has not been certified for transport of personnel it should not be used.
- Attention to detail is important – in this case a vital safety device (limit switch) was rendered useless by a faulty installation.

■ **Editor's note:** Various interesting animations of the accident can be viewed at the following URL: http://www.tsb-bst.gc.ca/eng/medias-media/videos/marine/m13l0055/index.asp

MARS 201540

Fire and ice

Edited from US Coast Guard Safety Alert 3-15

➔ A Liquified Petroleum Gas (LPG) vessel was loading LPG that was at a higher temperature than desired for transit. In order to cool the LPG cargo, the gas was re-liquefied to a lower temperature by using the vessel's boil off system. The gas was first directed to a compressor, compressed to a higher pressure, and then condensed back to a liquid at a lower temperature. From the condenser it flowed through an expansion valve and back to the tank.

It was reported that while this system was operating, the piping near the expansion valve began constricting flow due to freezing hydrates. This then caused an increase in system pressure from the expansion valve back via the condenser and to the outlet of the compressor.

Hydrates are compounds, in the form of crystalline substances, developed from the interaction of water and hydrocarbons at certain pressures and temperatures. They are commonly present in LPG cargoes and must be safely managed throughout the cargo system. Hydrates, if not removed, can result in frozen regulating valves, clogged filters, damaged equipment, and other problems in the related cargo systems.

It appears probable that the drains at a sample point were left cracked open, or just leaking, to allow hydrates to escape. In any event, significant accumulations of ice were noted in the bilge areas below the same sample point for two of the three liquid line drains. A hazardous flammable atmosphere was therefore allowed to develop and a spark of unknown origin ignited a fire near the condenser. It was extinguished quickly by a crew member using handheld dry chemical extinguishers.

The investigation also identified other concerns, such as:

- An emergency system left in the manual mode prevented remote activation;
- Senior organisational personnel for the operator and facility were not informed of the hydrate situations;
- Procedures for taking actions when gas alarms sounded were not followed; and
- Gas detection devices were not properly calibrated.

Lessons learned

It is likely that unsafe cargo handling procedures associated with manual draining of hydrates from the drain line on the outlet of re-liquefaction condensers directly contributed to this casualty.

Although not every scenario that involves decision making of officers and crewmembers can be documented, it is reasonable to expect that those procedures that are part of day-to-day operations are documented in the SMS. In this case, removal of hydrates was not a documented procedure.

Routine and frequent training should be given to shipboard officers and crew based on documented procedures; in the case of LPG vessels it should cover such topics as;

- The safety risk of releasing LPG in open and enclosed spaces;
- Proper methods to acknowledge and investigate gas detection alarms regardless of location (including making proper notifications to responsible parties);
- Ensuring that all ventilation systems are functioning as designed with no conditions hindering their effectiveness such as open doors or obstructions;
- Methods to inspect and identify leaks throughout the cargo system, and corrective actions to take when leaks are identified;
- Ways to manage and minimise the negative effects of hydrates throughout the entire cargo system;
- Methods to reduce static electricity as found in the National Fire Protection Association (NFPA) 77.

MARS 201541

Scorched tea towels pose fire risk

Edited from Marine Safety Forum Safety Flash 15-09

➔ After washing the galley tea towels the night watchman put them into the tumble dryer. Once finished drying, approximately 20 towels were stacked in a pile and placed on top of the galley freezer. Between three and four hours later, the night watchman discovered smoke coming from the pile of tea towels. Several tea towels in the very centre of the pile were found to be scorched and smouldering.

Spontaneous Combustion

Spontaneous combustion (ignition) occurs when a combustible material is heated to its ignition temperature by a chemical reaction and oxidation. For example, when the material is in a pile such that the internal heat generated cannot be adequately dissipated, the temperature can build up until ignition occurs.

Cloth contaminated with specific types of oil can spontaneously combust under certain circumstances. Specifically, linseed, rapeseed, safflower (vegetable oil ingredient), and peanut oil are prone to spontaneous combustion. Fish oils are also notorious for self-heating. On the other hand, mineral oils used for lubrication are not prone to self-heating and will not cause spontaneous combustion.

Fires in commercial laundry facilities, hospitals and laundromats have been attributed to the spontaneous ignition of cotton or linen that has been dried and then either stacked while still hot or dumped into bins without cooling. The oxidation of cotton and linen can be initiated by the laundry process. If the materials are stacked or binned at high enough temperatures (+ 90° C), the heat accumulated in the centre of the pile may be enough to trigger spontaneous ignition.

In this case, it is likely that there was some contamination from cooking oil still on the tea towels and enough residual heat from the tumble drying process to start the exothermic reaction that resulted in the scorching. This is initially a slow process, hence the three or four hour delay before smoke was seen.

Lessons learned

Cotton or linen washing should be spread to cool after mechanical drying, not placed in bins or piles while still hot.

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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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