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Seaways

The International Journal of The Nautical Institute

Thin ice

The NI's new book **p05**

The Nautical Institute

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Seaways
The International Journal of The Nautical Institute

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Diary

What's on?

Maritime Pollution: can we cope?
30 November
Sri Lanka Branch seminar

08.00–16.30, KDU, Kandawala Road, Ratmalana

Please email ni.srilanka@gmail.com to register attendance

Topics include ship-related pollution, spills and the coastguard's role; MARPOL and related IMO conventions; mariners' obligations towards the marine environment, and others. Lunch and tea provided.

To take advantage of the discounts available for events listed in the Diary section, please log in to www.nautinst.org using your membership details and click on 'Event Discounts'

01-02 November

Navigation Assessor Course
Panama
Contact: courses@nautinst.org
Discount available for NI members

05–06 November

Navigation Assessor Course
Miami, USA
Contact: courses@nautinst.org
Discount available for NI members

05–07 November

CrewConnect Global
Sofitel Philippine Plaza, Manila,
https://goo.gl/EkQhv7
Discount available for NI members

06 November

The Battle of the Atlantic
North East England Branch
HMS *Calliope*, South Shore Road, Gateshead NE8 2BE

06–07 November

e-Navigation Underway
California State University Maritime Academy
http://e-navnorthamerica.org/

07 November

Rescue of Refugees
US Gulf Branch
1330, West Gulf Maritime Association, Houston, TX 77029

Offshore Vessel Connect
Hilton Amsterdam, The Netherlands
https://goo.gl/it64t3
20% discount for NI members

07–08 November

Ballast Water Management
Rotterdam, Netherlands
www.wplgroup.com/aci/event
15% discount for NI members

Digital Ship Conference
Athens Marriott Hotel
30% discount for NI members

08 November

Marine Accident Investigation Branch
North East England Branch
'L' Block Lecture Theatre, South Tyneside College, South Shields

12–13 November

Navigation Assessor Course
Athens, Greece
Contact: courses@nautinst.org
Discount available for NI members

12–14 November

Shipping 2030
Intercontinental Times Square, New York City, USA
https://goo.gl/5Y5c5X
Discount available for NI members

13–14 November

Marine Incident & Analysis Course
Antwerp, Belgium
Contact: courses@nautinst.org
Discount available for NI members

15 November

End of year sundowner
Western Australia Branch
1730, Navy Club, Fremantle

20 November

Navigation Assessor Course
Abu Dhabi, UAE
Contact: courses@nautinst.org
Discount available for NI members

Captain John Lloyd FNI Chief Executive

Focus

Supporting professional development around the world

> Individual commitment to personal development is a key characteristic of the true professional

One of our key objectives as a professional body is to encourage and facilitate continuing professional development (CPD) by our members and others in the maritime community. We do this in different ways including books, seminars, training courses and other initiatives.

I am delighted this month to announce some important developments in this regard.

Book launch

Firstly, we announce the launch of a new publication, *Handling Ships in First-Year Ice*. Expertly authored by Capt Johan Buysse, this book both updates and builds on our previous publication *Handling Ships in Ice* to account for new developments in this sector. The book will of course complement the Ice Navigator programme. The latter continues to attract applications for certification, with Ice Navigators now approved from 16 different countries. If you have an interest in safe navigation in ice in areas such as the Baltic, St Lawrence or other non-polar regions, this is the book for you.

In a further move to support and encourage professional development, The Nautical Institute will be waiving postage and packaging on all books bought through our website (with the exception of logbooks) over the next four months. If you have been thinking of investing in any of our books or best-selling IMO publications, now is the time!

Individual learning

Individual commitment to personal development is a key characteristic of the true professional. I am thrilled to announce a brand new initiative that will make this both easier and cheaper for Nautical Institute members. At the end of October we entered into an agreement with one of the leading and perhaps best-known providers of online training, KVH Videotel, to create a special arrangement for our members.

Already live, the agreement allows all members of The Nautical Institute to access a carefully selected suite of online CPD courses offered by KVH Videotel completely free of charge. Each year members will be able to access one course free of charge. The courses are entirely free, and there will be just a modest administration fee should flag state or other formal certification be required.

This is a great opportunity to learn at your own pace and at a time of your convenience . You can experience all the latest offerings, ranging from Rule of the Road, maritime security and a host of safety-related learning opportunities. Details on how to participate can be found on p11.

My huge thanks to all involved in making this initiative possible.

Short courses

Our own short courses continue to be very popular. With our Navigation Assessor Training and the Incident Investigation and Analysis successfully completed across the Asia-Pacific region we have reached out on a truly global scale. This has been a huge effort from our subject matter experts and the supporting administration team at HQ. Very many thanks to you all. Following the success of these courses, we are also pleased to announce the launch of our Onboard Assessment for Optimising Performance course, which explains how to assess the results of training in all areas of the ship. For more information, or to find out when we are running a course near you, please visit www.nautinst.org. Alternatively, please contact courses@nautinst.org

The international aspect

Finally, I would like to thank those branches that have helped host me in a series of visits across India, Sri Lanka and in Houston where I received a very warm welcome from branch members and office-holders.

During my visit, I was able to participate first-hand in a meeting in Chennai, where the branch hosted a robust discussion on the issues affecting port development in India.

I was pleased to address a number of students during my visit to CINEC in Colombo and see the ambitious projects under way in the main harbour. My visits also included a visit to the Hindustan Institute for Maritime Training and various shipping companies in Mumbai, and participation in a great social and professional event in Cochin. I was honoured to present awards for bravery to many who contributed to rescue work following the recent floods in the area.

In Houston I was pleased to meet with members and to hear about the activities of the branch in support of professional development and mariner welfare. There is so much good work being undertaken by leaders in our membership and in the maritime community.

I wish you all safe passage on your voyages.

John

@NautInstCEO sec@nautinst.org

Captain V S Parani FNI FICS CMarTech-IMarEST

Captain's column

Making shipboard meetings matter

In early 2005, the Master of the ro-pax ship *Arahura* planned to carry out an emergency steering drill, as required by regulation. Usually the crew tested the non-follow-up (NFU) system, but on this occasion the Master decided to test the steering using the solenoid valves in the machinery space. However, he did not inform anyone else of his intentions until the last moment.

The Master went down to the steering gear, where he found that the First Engineer was not available because he was engaged in other priority work. The Chief Engineer expressed concern at carrying out this unplanned procedure, but the Master insisted, based on his experience with a sister ship.

Unfortunately, the solenoids were incorrectly marked. As a result, the crew member operating the solenoids moved the rudder to port instead of to starboard.

In the wheelhouse, the Third Officer and the cadet were unaware of the details of the steering drill. When the rudder was mistakenly moved to port, they informed the Master of the need to put the helm to starboard, but did not mention the presence of another ship in the vicinity. The *Arahura* now started swinging wildly to starboard. Only due to the alertness of the crew on the other ship was a collision avoided – by just 3 cables.

Among other factors, the investigating authority, Maritime New Zealand, found that:

- The Master of *Arahura* did not hold a prior meeting with the senior engineering officers to discuss the technical aspects of the drill.
- The Master did not inform the drill team or bridge that the execution of the drill would involve a different test method.
- The Master did not hold a pre-planning meeting to discuss the drill and how it would differ from the test method that had been used previously.

How do meetings help?

Meetings are where team focus is achieved. This is where we set up an atmosphere in which team members are comfortable communicating with each other. These meetings are very important for safety so that each person knows what the others are doing and they avoid incompatible tasks. It's also a good place to share problems so you can get inputs and even offers to assist from the rest of the team.

Here's how to make meetings effective, whether at sea or on land:

- **Set up meetings at regular intervals.** Don't just have them when you're having problems. The UK MAIB investigated a fire-related fatality on *Arco Avon* where the Third Engineer had worked on a failed fuel pipe without informing anyone. His reason for not doing so is likely to have been influenced by the onboard culture of routinely working alone and the absence of regular and frequent communication.
- While it is very tempting to put off meetings under the pretext of being busy, my experience has taught me that these meetings should not be cancelled unless there's a pressing reason to do so. You will be amazed at how many new challenges come to light during such meetings.
- **Cap them at 30 minutes.** Start and finish on time; finish earlier if no one has anything more to add.
- **Always announce the agenda at the outset.** It helps people to prepare and set expectations. A template helps to get the meeting off to a quick start and in the required direction. When you structure your meeting, the entire crew will appreciate your taking their valuable time into consideration.
- **Create an amiable atmosphere.** Sit or stand in a circle. Prohibit the use of electronic devices except for taking notes or referring to the agenda.
- **Take notes.** Record comments and draft an action plan.
- **Encourage participation.** Meetings are not the place to display authority, order, shout, argue or preach. Limit the time each participant gets to speak. Draw out reluctant speakers by asking them open-ended questions such as: 'Is there anything we have not considered?'

Lack of participation can lead to unforeseen problems. On the bulk carrier *Great Majesty*, the Master, Chief Engineer and Chief Mate met to discuss the operability of the ballast pumps. The Chief Engineer simply replied that one of the pumps could not be used. The Chief Mate did not seek to clarify if there were any other restrictions in using the ballast system, neither did the Chief Engineer elaborate.

When the ballast pump was disassembled for repair, the suction pipe and valves were not isolated. When the Chief Mate remotely opened the pump's suction valves, the open pump's casing was connected to the main seawater line, which resulted in the flooding of the engine room.

- **Conclude.** Discussions are great teamwork tools, but they must always end in action plans. The last two minutes of the meeting should be spent summarising who will do what, by when, and how you will communicate.
- **Motivate and energise.** I've always found meetings to be a good way to connect with and motivate my team. Getting an opportunity to speak also helps team members build self-confidence. In addition, regular meetings help one assess people's individual capabilities.

Meetings are a great opportunity to clarify issues, sharpen focus and align the team with the objectives. They help support a robust safety culture on the ship. Meetings are a great leadership and teamwork tool, and effective leaders run productive meetings.

What else do you do to make your meetings matter?

Handling ships in first-year ice

Recent developments in ship design and routeing along with climate change have created the need for a new edition of The Nautical Institute's classic guide. What's changed and why?

Captain Johan Buysse MNI

Since this practical guide was first published by The Nautical Institute in 2007 the techniques of handling of ships in first-year ice largely remain the same. However, recent developments have affected certain operational aspects. For example, information gathering has changed now that most vessels have (or should have) access to detailed information via the internet. There are new means of detecting ice. The Polar Code has been implemented and greater use is being made of ice-infected or affected shipping routes and ports.

A few years ago following serious propeller damage to his ships after sailing in ice a shipowner asked me to act as an ice adviser on a newly built sister ship. I was asked to provide some basic training to ship's staff on a Baltic winter voyage for the 1A-classed 2,500teu container vessel. Upon signing on I was shocked at the staff's complete lack of knowledge of any aspect of ice navigation including winterisation, gathering information and handling the vessel in ice and under icebreaker escort.

That prompted me to revise this publication by providing mariners with updated information, more realistic visual illustrations and more explanation about the phenomenon of icing, as icing can affect any vessel whether or not it is heading for ice-bound ports.

As global warming reduces the density of ice concentrations, more areas, routes and ports are being opened to shipping, including the Arctic waters around northern Russia, Alaska and Canada and the Northern Shipping Route (NSR). More ships are being designed and built to operate in these extreme conditions. These include double-acting ships, such as the shuttle tankers designed for year-round transportation on the Varandey–Murmansk route.

Although climate change from global warming is more and more evident around the world, first-year ice remains an annual major obstacle for commercial traffic in the Baltic. Ice seriously limits a vessel's speed and manoeuvrability. Ships risk damage to their propellers, main engines, rudders and hull plating. Limitations when operating in ice increase the risk of colliding with structures, other vessels, berths and icebreakers. Running aground is also a real hazard. Handling ships in ice demands specialist knowledge and skills and it is the purpose of this book to demonstrate why they are necessary.

Some ships, especially the powerful 1A Super class, are designed and built to operate in heavy first-year ice conditions. The very nature of their design, speed and power means that if they are not carefully handled, there is a high risk of collision in ice, grounding or damage due to extreme loads on their mid-bodies in harsh ice conditions.

Deficiencies of communication, organisation, operational instructions and routines related to ice navigation have also resulted in accidents, damage to hull and machinery and serious commercial loss.

Even on a vessel that meets all its ice-class requirements, the performance of the ice navigators will be closely watched by pilots and icebreaker staffs, who will prepare reports about this performance and send them to local maritime administrations. Based upon those reports, an administration may decide that a particular vessel is not suited for winter navigation because it is causing unacceptable delays to other vessels.

This is why it is important to have ice experience that, combined with the icebreaking capabilities of one's own vessel, can build up 'credit' with the icebreakers and ensure a good reputation with the administrations, pilots, operator and/or charterer.

At one moment in my career, at the beginning of winter, an owner transferred me from a 4,000dwt class 1A, 13 knot vessel to a 21,000gt, 1A Super class, 19kt ro-ro ship. All of a sudden, all hell broke loose. From chugging along in leisurely fashion on an old lady, a few days later I had to handle what seemed like an untamed beast. Luckily for all concerned (and especially the owner), the company decided not to set me loose without assistance, which initially came from a 1AS and ice-experienced Master. Even so, most of my present grey hairs appeared during the first month while on this command.

Over the years and after eight winters in the Baltic, I came to realise that ice navigation is a vast subject, which covers at least the following:

- Knowledge of the winter season and of the micro-climates of the trading area, such as the Baltic Sea or the St Lawrence
- The phenomenon of icing
- Ship classification as it applies to ice navigation
- Traffic restrictions imposed by local authorities
- Practical knowledge of ice navigation in narrow channels, fairways and ice-bound ports and their basins
- Navigating alone in ice-covered seas
- Assisting other lower-classed vessels
- Navigating in convoy or under icebreaker escort
- Manoeuvring in close quarters, overtaking and meeting other vessels, un/berthing
- Icebreaker characteristics, their manoeuvrability, signals and orders
- Knowledge of the formation, movement and dispersal of ice in a certain area
- Precautions regarding prevention of ice-clogging of intakes and cooling systems
- Iceberg-infested waters and Polar navigation (Polar Code).

Throughout the book, straightforward, practical advice and checklists provide instructions on operating in ice, while detailed illustrations and diagrams add an important visual element. operating in first year ice. A series of 'rule boxes' highlight the most important information.

Chapters cover:

- Voyage preparation
- In ice at sea
- Navigation in fairways and under pilotage
- Icebreaker assistance
- Berthing and un/mooring.

The following extracts give some idea of the practical, straightforward advice provided throughout the book.

In ice at sea

The longest part of a journey through ice-infested waters is usually where the ship, entirely on its own, has to battle its way through from

the ice edge towards the pilot station or to the ice waypoints where icebreaker assistance can be obtained. From a commercial point of view, it is in this portion of the passage that losses can be considerable.

Operators/owners of vessels that regularly trade in ice-bound waters should consider investing in modern ice detection hardware and/or software. Their use can bring considerable overall savings in operational expenses, time, bunkers and damage avoided.

Entering the ice-edge

When the first signs of ice (in any form) are detected, inform the engine room as soon as possible to prepare engines for passage through ice. As a minimum, consider:

- Choice of sea-chest or cooling water intake/recirculation
- Preparing sea-chests for avoiding problems with frazil or shuga
- If still on shaft generator, shifting to auxiliary generator(s)
- Stopping the fresh water generator
- Availability of all starting air compressors
- Adjusting the settings of the load limit on the main engine(s). Some vessels have an 'ice mode' safety setting which, when engaged, reduces the maximum power output to a level suited for its ice class (over-powered ships)
- Shifting main engine(s) from IFO/HFO to MGO/DO.

In open drift ice, speed should be reduced to avoid colliding with loose ice floes at full speed. (It is worth remembering that the force of impact is directly related to the vessel's displacement and the square of the speed.) If a collision with a floe or growler is unavoidable, try to hit the floes squarely with the bows, as the stem is the strongest part of a ship.

Statistics on ice-classed ships show that most hull damage is sustained in the early part of the winter, probably due to high speeds in an ice coverage of less than 10 when the vessels first hit the ice floes.

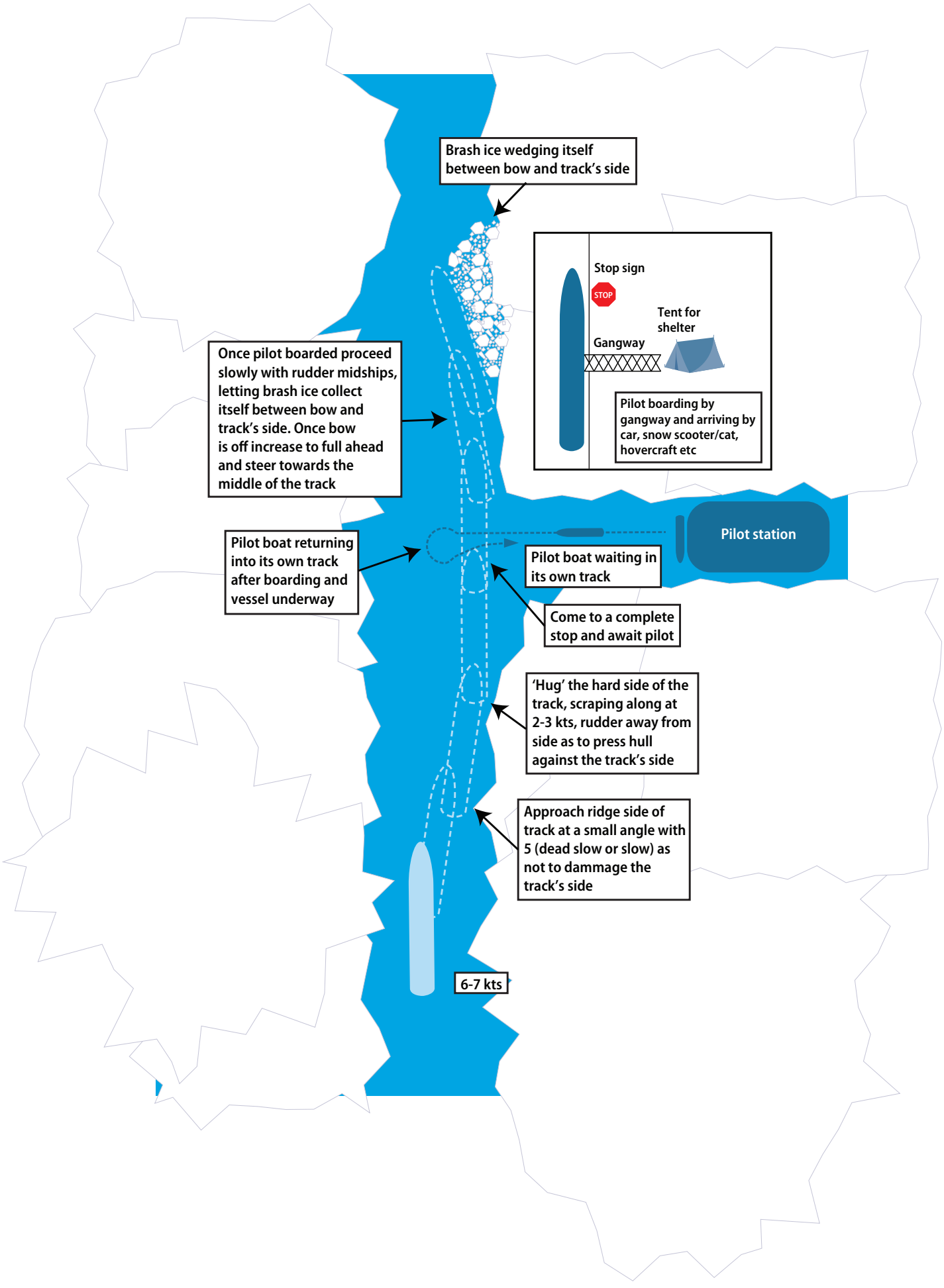
Working with a pilot

As the vessel approaches its final destination, traffic and ship movements are usually denser, with VTS, icebreakers and pilots offering or providing extra advice and services. The navigable waters may become restricted and ice is likely to restrict or interfere with the vessel's normal manoeuvrability. The mariner may therefore face some challenging situations before finally ringing off the engines when moored alongside.

Although pilots of ice-bound ports are experienced in handling ships in ice, good seamanship dictates that they are on the bridge to provide advice; the Master always remains in command. When sailing in ice, constant supervision of the pilot's performance is essential for following reasons:

- During severe winters, especially at their onset, ships may have to transit fairways with which pilots are unfamiliar. Fairways such as the 9-metre fairway between Porkkala and Helsinki/Hamina inside the Finnish archipelago may be used only every six or seven years.
- In severe winters, there may be a change in the pattern of use of pilot stations. The pilots in these stations may not be familiar with certain types of ship such as the bigger, faster ro-ros and container vessels. Special consideration should be given to their stability status, as lists may be more pronounced when engaging sharp bends in the track.
- The additional traffic may result in some pilot stations working overtime, leading to long working days, fatigue, stress and a shortage of pilots.
- When meeting or overtaking another vessel in the track, ask the pilot to report what has been agreed with the other vessel.
- The tracks being followed should be double-checked using radar and leading lights. These tracks can shift when the ice starts moving in early winter or spring or under the influence of strong winds.

Most pilots are willing to discuss their techniques and tactics in ice.


Brash ice wedging itself between bow and track's side
Stop sign
STOP
Tent for shelter
Gangway
Pilot boarding by gangway and arriving by car, snow scooter/cat, hovercraft etc
Once pilot boarded proceed slowly with rudder midships, letting brash ice collect itself between bow and track's side. Once bow is off increase to full ahead and steer towards the middle of the track
Pilot station
Pilot boat returning into its own track after boarding and vessel underway
Pilot boat waiting in its own track
Come to a complete stop and await pilot
'Hug' the hard side of the track, scraping along at 2-3 kts, rudder away from side as to press hull against the track's side
Approach ridge side of track at a small angle with 5 (dead slow or slow) as not to dammage the track's side
6-7 kts

Developing pilotage plans on bridge simulators

Methodology, benefits and challenges

Karan Bhawsinka
Port Study Manager, CSMART
Hans Hederström
Managing Director, CSMART

In most cases when a pilot is boarding a ship for an arrival, the time for the Master/pilot information exchange is by far too short. Except for dynamic topics such as weather and traffic etc, the Master/pilot information exchange should be done in advance by both parties.

To facilitate this, Carnival Corporation has allocated significant resources at its maritime training facility CSMART to carrying out bridge simulator assisted port risk assessment studies.

One of the primary objectives of this program is to work with bridge teams and local port pilots to develop pilotage plans for specific ports on a bridge simulator. In 2017, 21 port risk assessment studies were carried out, and a similar programme is underway for 2018.

Creating the port risk assessment study

Every port risk assessment study is conducted by a team made up of CSMART representatives, Captains and senior officers from Carnival Corporation's fleet, local port pilots and subject matter experts from the industry, including:

- Active pilots;
- Retired pilots;
- Ex-cruise ship captains;
- Retired cruise ship captains;
- ECDIS and risk assessment experts from the maritime industry.

For every port, the whole team spends five days at CSMART, spending approximately 25 hours on full mission bridge simulations and 15 hours on brainstorming and debriefing. The findings, including a developed pilotage plan, are reported and shared across the Carnival fleet.

Identification of critical elements

At the beginning of the port study, various hazards in the port are identified. Based on these hazards, certain critical elements are defined. Critical elements are navigational parameters (eg ship's speed, drift angle, distance to obstructions etc.) that must be closely monitored in order to effectively execute a manoeuvring plan. For example:

- If breakwater head is a hazard, distance to breakwater head and passing speed are critical elements.
- If channel width is a hazard, drift angle is a critical element.

Critical elements must be defined so that they can be effectively monitored and controlled by the bridge team using visual and digital methods while executing arrival or departure manoeuvres. Once they are defined, 'planned zones' and 'no go limits' are specified for each of these elements. (See *Seaways*, June 2018 and October 2018).

Creation of pilotage plans

The pilotage plan is the foundation for the navigation control process. Clear and visible (on ECDIS) limits must be defined in the plan as they form triggers for when the bridge team should intervene.

A waypoint based route plan and a manoeuvring plan are made, based on the critical navigational elements and planned, reserve and no go zones identified in the first part of the process. It is essential that this plan is prepared together with the ship officers and port pilots. Where applicable, a commit point is identified and clearly indicated on pilotage plans.

Check the plan

A number of arrival and departure runs are executed on the simulator in normal and limiting weather and tide conditions. The original route and manoeuvring plan is adjusted and refined as the simulations progress. A detailed risk assessment is conducted for every simulator run. The overall risk assessment is divided into three parts:

NUMERICAL RISK ASSESSMENT

Every simulator run is analysed to assess how much power and manoeuvring margin the ship had in reserve during the run. If the weather changes suddenly during the run, or the navigator makes a steering error, or a command is misinterpreted by the helmsman or the tug master, there should be enough power and manoeuvring margin in reserve to take corrective actions.

Power reserves are estimated by calculating engine, steering, thruster and tug exploitation during the run. Manoeuvring margin reserve is estimated by measuring minimum passing distance between the ship and all the identified hazards and also by measuring ship's speed and drift angle in critical sections of the manoeuvre. The smaller the reserves, the higher the probability that the manoeuvre can become unsafe.

NAUTICAL RISK ASSESSMENT

Participating pilots and bridge team members fill in a risk assessment form after every simulator run. In the form, they rank risk levels based on their professional judgment and experience The form also gives bridge team and pilot an opportunity to comment on various issues faced during the run and to mention specific risk mitigation measures. They are also asked whether they would do this manoeuvre in reality under the same weather conditions.

FINAL RISK ASSESSMENT

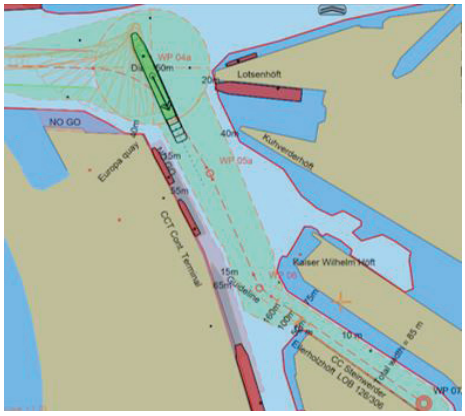
The subject matter experts observe each simulator run and debrief the bridge teams and pilots afterwards. They control the run schedule to ensure all appropriate scenarios are assessed. At the end, they receive all the numerical and nautical risk assessments, together with log files of all the runs, which can be replayed as necessary. They then assign a final risk score to each run.

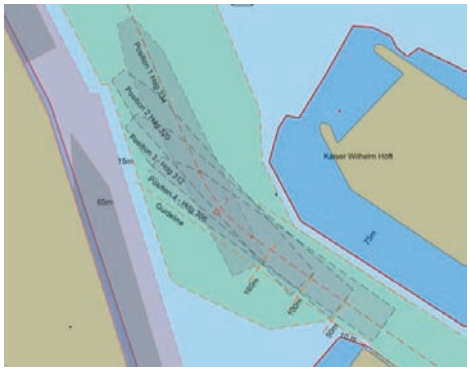
Waypoint Table - Arrival

Name	Description	Latitude	Longitude	Turning Radius	Speed min	Speed max	Planned Corridor Port width	Planned Corridor Starboard width
WP 01	Lotsenhous	53°32.5395'N	009°52.3305'E	0.50NM		10.0kn	63m	120m
WP 02	Parkhafen	53°32.4816'N	009°54.4642'E	0.50NM		8.0kn	63m	120m
WP 03	Köhlbrand	53°32.4935'N	009°55.6199'E	0.50NM	4.0kn	6.0kn	63m	70m
WP 04a	Turning circle arr	53°32.4575'N	009°56.8624'E	0.20NM	2.0kn	4.0kn	55m	100m
WP 05a	Vorhafen arr	53°32.2532'N	009°57.0601'E	0.20NM	2.0kn	3.0kn	55m	100m
WP 06	KaiserWilhelmHoeft	53°32.0267'N	009°57.2171'E	0.10NM	0.5kn	1.5kn	30m	40m
WP 07	Steinwerder	53°31.7949'N	009°57.7544'E					

The waypoints, above, and manoeuvring plan below are part of a pilotage plan developed at CSMART for large cruise ships arriving at Steinwerder pier in the port of Hamburg. This plan was prepared together by our Captains and local port pilots using our bridge simulator at CSMART. Pilotage plans prepared and presented in this format are very useful for pre arrival/departure briefing between the bridge team members and for master pilot exchange.

Route plan – Steinwerder Pier – Port of Hamburg

Pilotage Plan Overview Arrival	Comments
	WP04a – Swinging circle diameter= 450m From WP04a to WP06: Planned Corridor: West of track= 55m East of track= 100m Planned Speed= 2-3 kts astern From WP06 to WP07: Planned Corridor: SW of track= 30m NE of track= 40m Planned Speed= 0.5-1.5 kts astern



WP06 – turn around the Kaiser Wilhelm Höft

At the turn by WP06, the following details are crucial to observe in order to achieve a successful manoeuvre:
- longitudinal speed
- lateral speed fwd & aft
- the position of the vessel throughout
- distance from the corner at "Ellerholzhöft" using the distances from the Pilots; (160m/100m/50m)
- final heading only allows for a drift angle of 4 deg (66m swept path)

Manoeuvring plan – Steinwerder Pier – Port of Hamburg [3]

Observation during a simulator run	Risk Level	Risk Score
• Loss of control of ship • Inability to manage the position of the ship resulting in collision or grounding • Severe stress and workload of the bridge team and pilots	Very High	5
• Control of ship maintained with full use of available power for long time • Ship came close to one or more hazards • Significant stress and workload of the bridge team and pilots	High	4
• Control of ship maintained with modest or high use of available power • Distance from all hazards maintained with modest difficulty • Ordinary stress and workload of the bridge team and pilots	Moderate	3
• Control of ship maintained with minimal use of available power • Distance from all hazards maintained with minimum difficulty • Slight stress and minimal workload of the bridge team and pilots	Low	2
• Control of ship maintained without any difficulty • Distance from all hazards maintained without any difficulty • Negligible stress and negligible workload of the bridge team and pilots	Very Low	1

Observation during a simulator run	Risk Level	Risk Score
• Bridge team and pilot gave a risk score of 4 or 5 • Ship entered No Go area or collided or grounded • All available power was used for considerable time • Consultant's professional judgment is that control of ship's speed and/or position was totally lost	Very High	5
• Bridge team and pilot gave a risk score of 3, 4 or 5 • Ship utilized majority of speed or navigable area reserves • Excessive power was used for considerable time by few powering units • Consultant's professional judgment is that control of ship's speed and/or position was poor	High	4
• Bridge team and pilot gave a risk score of 2, 3 or 4 • Ship utilized considerable speed or navigable area reserves • Excessive power was used for considerable time by a powering unit • Consultant's professional judgment is that control of ship's speed and position was average	Moderate	3
• Bridge team and pilot gave a risk score of 1, 2 or 3 • Ship utilized some speed or navigable area reserves • Excessive power was used for some time • Consultant's professional judgment is that control of ship's speed and position was good	Low	2
• Bridge team and pilot gave a risk score of 1 or 2 • Ship never utilized speed or navigable area reserves • Excessive power was never used • Consultant's professional judgment is that control of ship's speed and position was excellent	Very Low	1

Fig. 4 Risk scale used by bridge team and pilots (left) and SMEs (right)

When a run is assessed with a final risk score of 3, 4 or 5, risk mitigation measures are identified. When appropriate, the residual risk is assessed by repeating the run with these measures in place.

The commit point is assessed by making abort runs in extreme weather and tide conditions. If the runs are not successful, the commit point position is changed and tested again until a satisfactory position is mutually agreed between bridge team and pilots.

Defining the operational envelope

The operational envelope is defined as weather and current conditions with a risk assessment score of 3 or less. Risk mitigation measures, such as the use of tugs, are stated where appropriate.

Overall risk assesment scores of 4 or 5 indicated an elevated risk level. Under these conditions, the bridge team is advised to reasses their decision to call.

Arrival and departure manouevres can be conducted with moderate or lower risk by using the developed pilotage plan when conditions are within the defined operational envelope. For conditions outside this envelope, a commit point is also identified.

Benefits

This process gives a unique opportunity for bridge teams and local port pilots to work together on a ship's bridge without the stresses of real world operations. They spend one week together at CSMART developing and testing pilotage plans for a specific class of conventional and/or podded cruise ship while entering and leaving a specific port. This strengthens the pilot-bridge team working relationship and develop a 'shared mental model' between them which is critical for the safety of navigation.

Challenges

Developing pilotage plans on a simulator comes with its own set of challenges. A few of these are highlighted below:

NAUTICAL CHARTS

Ideally, all the simulations should be done using official ENCs on an ECDIS. Ships can only use official charts for navigation, so a plan made using these charts is more useful and easily comprehensible.

But there are several limitations in using official ENCs on a simulator. First of all, most official charts are locked for editing (British Admiralty charts are locked but NOAA charts are not). It is not possible to add an upcoming pier or new bathymetry data, for example. Also, using official charts for simulations can lead to mismatch between visuals and charts.

For developing pilotage plans, we buy unlocked charts when open official ENCs are not available. This way, we can insert high density bathymetry data (when provided by the port), which is critical for developing these plans.

WIND DEFINITION

Most simulators use the 10 min mean wind measured at 10 m height. This is because most wind coefficients are measured in wind tunnel tests which use meteorological wind as reference. This is not the same as the wind speed read from the ship's wind indicator, which depends on height and position of the anemometer, design of hull, local topography, etc.

When we are doing simulations with 20 knots wind, we regularly get feedback that the ship reacts as it would in 25 knots wind – because this is how it would be registered on the anemometer which the officers are using as a reference. Any simulation results from a bridge simulator should very clearly highlight this limitation.

HUMAN FACTORS

To verify the operational limits, simulation runs made at the upper end of the operational envelope should be repeated two or three times, using a different navigator each time. Using the same bridge team for multiple days on a simulator means they can become very good at repetitive tasks, so varying the team adds resilience. Unfortunately, this is not always possible due to constraints of time and money.

PRESENTATION OF RESULTS

Pilotage plans developed on a simulator are not – and should not – be provided to ships in a plug and play format. They should be presented in a report format which should be used as a guideline. Use of the plan should never be enforced. This is particularly important when there is a difference between official chart data and charts used during simulations (which may be more up to date than official charts).

SCOPE

The pilotage plans developed on a simulator must not be directly used for navigation and do not replace appropriate voyage planning as required by company policies. Rather, they form a very good benchmark on which to base the actual plan, having been developed by a very experienced team. The plan developed on the simulator must be adjusted and fine-tuned during real world operations to account for the prevailing weather conditions and traffic in the port.

It is very easy to overcomplicate or oversimplify the pilotage plans made on the simulator. The number of critical elements should be kept in check to keep the plan relevant. The planned navigation zones should be wide enough to account for different wind and current scenarios and at the same time leave room for a reserve area. There is no need to create a separate plan for every possible wind direction and for flood and ebb current.

It is best to create a plan that works in most conditions and leave the final fine-tuning to the adaptive capacity of the ship's officers and pilots. For example, the person conning the ship may decide to stay on the upper limit of the planned zone in one set of conditions, and on the lower limit for another set.

LIMITATIONS

The results of the simulation are directly related to:

- Quality of the ship models;
- Quality of the port database;
- Capabilities of the bridge simulator;
- Availability of detailed wind data (including local shielding areas) and tidal current data (2D/3D time and spatially varying current model).
- Competence of the participating team.

Fine-tuning

As part of Carnival Corporation, CSMART has access to a fleet of over 100 ships.We can request individual ships to do certain controlled manoeuvres and record the generated data enabling us to fine-tune our simulator models. Carnival Corporation also has three Fleet Operation Centers which record real time position, control and weather data from ships in its fleet. This data can also be used to fine-tune the ship models for simulations.

Including high density bathymetry in port databases is critical for getting useful results from simulations. The No Go areas, the bank effects, squat calculations etc. depend on correct modelling of bathymetry. To do this is a big challenge on a simulator. Different ports provide bathymetry data in different file formats and in different coordinate systems. The person developing the port database requires hydrography knowledge and software.

This paper is an edited version of a presentation given at MARSIM 2018. The full version is available on request from the editor.

Member exclusive: access online courses!

Free online development courses available for Nautical Institute members

"Competence is not forever; knowledge fades and responsibilities change," explains Steven Gosling MNI, Quality Assurance Manager at KVH Videotel.

A seafarer's ability to monitor and update their professional expertise is of key importance, whether that involves revision of key regulation, assessment of current competence or preparation for a new role.

Supporting professional development is one of The Nautical Institute's core aims – which includes providing access to training. With this in mind, we are delighted to announce that The Nautical Institute is working with KVH Videotel to give members access to a set of online courses covering essential topics such as Colregs and IALA buoyage, crisis management and marine environmental awareness. Nautical Institute members can access one course a year free of charge.

The courses cover a wide range of sectors and career stages. Several courses deal with specific regulation and have flag state approval, preparing candidates for statutory certification.

Presented in a simple, easy-to-follow format using photographs, video clips and animations, the courses break down complex, technical subjects to make professional development accessible and flexible. An English language voiceover provides helpful guidance. Courses last between four to forty hours, depending on topic, and can be taken at a pace to suit to the learner.

Steven Gosling explains: 'KVH Videotel courses are different from other types of training in that they are entirely learner-driven. Candidates enjoy rich, interactive content delivered onscreen at a pace to suit them and in a space that is comfortable and convenient. There are no costly hotels or flights needed to visit a training centre and the array of tests and exercises featured within the courses help the learner to consolidate and keep track of new-found knowledge. Whether you are a junior deck officer in Europe or a senior Master in Asia, e-learning is capable of delivering reliable and consistent training to a global audience.'

Seafarer safety is central to each course, with risk assessment, prevention and control highlighted throughout. Enclosed Space Entry and Emergency Awareness, for example, delves into one of the most potentially dangerous activities on board. It is a subject which often lacks both recognition and training, and for which safe ways of working are all too often ignored or poorly implemented. KVH Videotel's course on the topic incorporates six crucial modules giving the candidate a clear and explicit explanation of the dangers presented by enclosed spaces, as well as advice on equipment and personal safety.

On completion of the course candidates are invited to take an online test encompassing questions from all modules. The test result is delivered onscreen and may be recorded by the learner in a CPD file or other record of achievement. Where an official certificate is required, the candidate's work must be authenticated and submitted to KVH. A small fee is charged.

For members seeking to enhance their professional capabilities, gain confidence or simply consolidate knowledge, the online course collaboration between The Nautical Institute and KVH Videotel presents an invaluable opportunity for all.

Members wishing to take advantage of this exciting new benefit should email member@nautinst.org stating the course they would like to take.

Courses include professional topics such as working with tugs

KVH Videotel courses available to Nautical Institute members

COURSES WITH FLAG STATE APPROVAL

- Crisis Management & Human Behaviour
- ECDIS Training
- Maritime Security Awareness
- Risk Assessment at Sea
- Safety Officer

OTHER COURSES

- Colregs & IALA Buoyage
- Enclosed Space Entry & Awareness
- Environmental Officer
- ISO 14001: Environmental Management
- ISO 150001: Energy Management
- Marine Environmental Awareness
- MLC (for Ship Masters)
- Onboard Trainer & Assessor
- Passenger, Mustering & Crowd Control
- Survey & Examination of Lifting Appliances
- Vessel Resource Management
- Working with Tugs

Time for change

Expanding on the need to update Colregs

Captain Mark Bull FNI

Captain Jutrovic's article Rethinking collision avoidance (*Seaways*, Sept 2018) is both welcome and timely. Not only should the introduction of a rule concerning very large ships be considered, but numerous other changes that have occurred since the introduction of the current collision regulations in 1977 should be taken into account. In support of Captain Jutrovic's points, here are some examples of problems that I have observed during the conduct of navigation assessments.

TSS routes

Both these incidents occurred while on board very large ships within traffic separation schemes (TSS). It is bad enough when a small vessel is occupying the centre line of a traffic lane with little consideration for the very large vessels forced to navigate close to the limits of such lanes; it is far worse when such small vessels are in direct contravention of Colreg 10. Once upon a time VTS would have broadcast warning messages about such contraventions. This is no longer the case.

Fishing vessels

On numerous occasions during navigation assessments I have observed fishing vessels passing clear ahead of own vessel only to reverse course at the last minute, requiring emergency action from the OOW to avoid a close-quarters situation or collision.

Taken on board a VLCC in TSS. Note vessel on a reciprocal course (above crane)

Taken from a capesize bulk carrier following TSS deepwater route. The ferry crossing ahead is hardly at right angles.

I know of one case where a vessel was involved in a collision with a fishing vessel and the OOW was chastised for using a CPA of 2.5 cables. The reality of life is that if ships were to allow more than this, in certain areas they would be unable to move for months – as the series of screenshots opposite shows. (Note that the AIS was up to capacity with targets within 12 miles, which is why more AIS targets are not seen on the screen.)

Deep-draught vessels within TSS

As Captain Jutrovic rightly points out, in a close-quarters situation the decision about what constitutes impeding a deep-draught vessel lies with the non-deep-draught vessel. It would appear that in the majority of cases, the smaller vessel has no awareness of just how critical the under-keel clearance (UKC) is.

An example is shown opposite. Own vessel (deep draught) alters course for a crossing vessel and complies with Colregs. This takes it closer to shallow water than planned. In the event, tidal height was sufficient – but this will not always be the case. One remedy is to reduce speed instead of altering course, but if the deep-draught ship is already proceeding at a slow speed further problems arise.

In certain parts of the world, ultra-large vessels are provided with an escort, which has proved to be very effective.

In others, one-way traffic is established to allow safe navigation of large vessels in narrow channels.

What has changed?

The 1972 Regulations for the Prevention of Collisions at Sea came into force in 1977. Forty-one years on, we have seen the introduction of equipment that has an impact on these Colregs, including ARPA, AIS and now ECDIS. Other changes include the introduction of the STCW Convention, ISM Code and the Maritime Labour Convention as well as changes to STCW. Most importantly, however, the volume of traffic has multiplied, the density of traffic on key sea lanes has increased and ships have grown substantially in size. This in turn leads to more frequent close-quarters encounters.

It is therefore incongruous for the Colregs to continue in their current format.

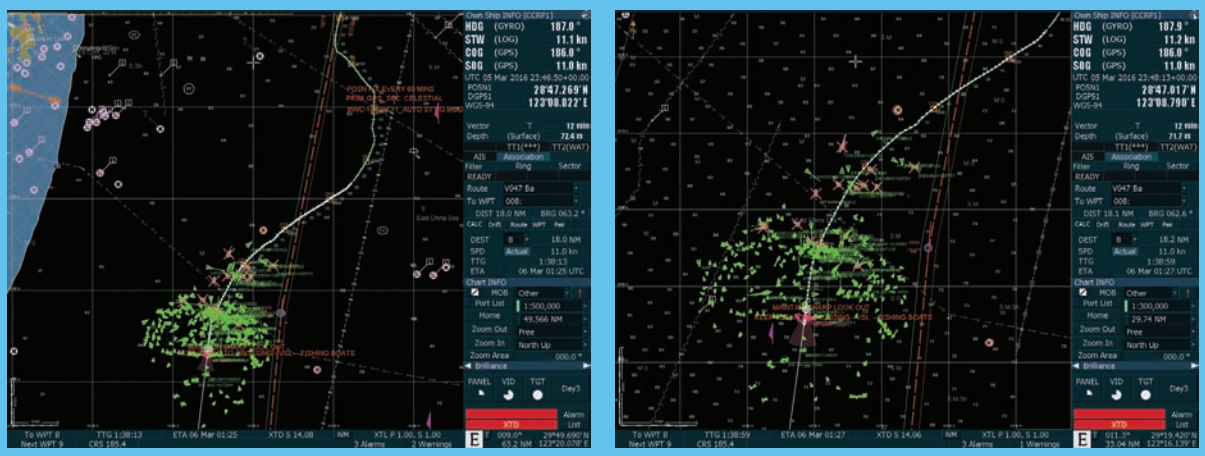
Some fundamentals

CONDUCT IN TSS

TSSs vary in size depending upon their location. Where they are narrow, dangers to surface navigation can lie very close to the edges of the lanes. Small ships are often found hugging the centre of the TSS lanes, forcing large ships to overtake on either side, thereby reducing their own safety margins. Would it be possible to include a requirement that vessels shall keep to the side of the lanes except where overtaking?

DEEP-DRAUGHT VESSELS

Greater privilege should be extended to deep-draught vessels than currently exists. The use of deepwater routes should become more disciplined; note especially that in the Dover Strait, this route is not a recommendation. It is clearly stated in the IMO ship routeing guide that 'ships that can safely use the route to the South East shall do so', leaving the deepwater route for those that need it.



Fishing vessels surrounding own ship - is there any practical way to keep a CPA of 2.5 cables?

In this example, altering course to comply with Colregs puts a deep-draught vessel closer to shallow water than planned

TRAFFIC CONTROL
Is it time that some form of traffic control be implemented in the known choke points?

LOOKOUT
Is the term now outdated? We have radar and AIS to assist in the identification of targets so use of 'all available means' must take these into account. Is the AB keeping bridge watch qualified to interpret the radar display or the AIS targets showing on the ECDIS? Compare this with what is quoted about sole lookout – does this mean that an AB only keeps visual and aural lookout? How is that recorded?

VISIBILITY
In the interests of simplicity, could we do away with two different conditions and just have one? Why not require that all vessels that move away from the coast shall be provided with an AIS?

SOUND SIGNALS
The range of sound signals is often quoted as 2 miles. Once the range between vessels is 2 miles, most ships seeking to avoid collision under Colregs have already started to take action. Anyone who has sailed on a ship with a totally enclosed bridge will confirm just how useless the sound reception systems are. Perhaps it is time to shift the manoeuvring signals to AIS to provide positive communication between the vessels.

PRIVILEGED VESSELS
Can you imagine what would happened if a hot air balloon or light aircraft strayed into the main flightpath approaching a major airport? Fighter aircraft have been scrambled to challenge commercial airliners that failed to respond to air traffic control, but what would happen in the marine equivalent?

- Sailing vessels: Can we continue to operate with the rule that steam gives way to sail? Could this be changed so that a sailing vessel is expected to follow the rules as would a powered vessel, and be considered a hampered vessel when it is unable to start an engine ?
- Fishing vessels: They should be kept well clear of areas where commercial vessels are obliged to follow a TSS. In fact, fishing should be prohibited in certain large tracts of sea areas with TSSs. A beneficial side effect is that this would help the recovery of fish stocks. In offshore areas that attract huge fishing fleets, safety fairways could be implemented, marked by virtual navigation aids.

CONFLICT WITH OTHER CONVENTIONS
Colregs are quite clear: if necessary a ship SHALL slacken her speed or stop or reverse. However, STCW says that timely notice of intended variations of engine speed shall be given where possible. Why? I have it on good authority from three senior former Chief Engineers that you cannot break the engine by slowing down. This paragraph in STCW lies at the heart of why officers are unwilling to touch the telegraph between FAOP and SBE EOP and it needs to be amended. It should be replaced with an unambiguous and unequivocal statement that 'the OOW has unrestricted use of all bridge equipment, main and auxiliary machinery to ensure navigation safety'.

Short course: Onboard assessment for optimising performance

Following the success of The Nautical Institute's Navigation Assessor short course, we are introducing a course exploring how to organise, administer and conduct onboard assessment across all areas of the vessel

Captain Sarabjit Butalia FNI
Captain Michael Rydén FNI

We tend to give a great deal of thought to training, but pay far less attention to assessing the results of that training. The fact is that training cannot be successful in the absence of an objective and comprehensive assessment process.

The training itself may be excellent, but without quality assessment we are unable to verify this. Assessment not only helps in providing a means of measuring the effectiveness of the training process, but it can also be used as a tool for tracking development and providing continuous improvement. Stakeholders need to understand that assessment is a critical and necessary part of training and a primary tool in ensuring safe operations.

The Onboard Assessment for Optimising Performance course

With this in mind, The Nautical Institute has developed a short course for onboard assessors. The course takes place over 2.5 days and is intended to develop and enhance participants' abilities to organise, administer and conduct in-service assessment of seafarers on board.

Participants would usually be senior shipboard officers (management level), including officers who are due for promotion and career development. DPAs and superintendents may also find the course valuable. Additionally, the course may be suitable for shipboard personnel at operational level or experienced shore-based instructors who have sufficient onboard expertise.

A short course of this kind cannot provide comprehensive assessor training, which would take much longer. However, it does cover the many principles of developing and implementing a competence-based shipboard assessment system. A key focus is how to identify and select performance measures and standards. The main part of the course deals with the techniques of conducting the assessment and developing a performance improvement plan. Attendees will be familiar with the concepts generally taken into account when developing a suitable assessment package for a particular type of ship.

On completing the training course, participants should be capable of undertaking all the responsibilities expected of assessors within their field of expertise:

- Apply the international provisions concerning the training and assessment of officers and ratings on board ships
- Apply the international provisions in the context of national law

FACT FILE

Regulatory background

The standards of competence that have to be met by seafarers are defined in Part A of the International Code on the Standards of Training, Certification and Watchkeeping for Seafarers (STCW Code).

The Nautical Institute's onboard assessment course aligns with IMO Model Course 1.30, which has been developed to support the implementation of the STCW Convention, 1978, as amended and, in particular, regulation I/6 of the STCW Convention and section A-I/6 of the STCW Code. The course also contains applicable elements from OCIMF/TMSA Section 3 third edition (2017).

Who should attend?

Management and operational level deck and engine officers or experienced shore-based instructors with sufficient onboard expertise. They should meet the standards set out in the STCW Convention, 1978, as amended. This includes:

- Captains and senior ship officers;
- Operational level deck and engine officers;
- Technical and marine superintendents;
- Designated persons ashore (DPA);
- Operational ship managers.

Course content

The course schedule includes both practical and theoretical aspects.
Approximately 45% of the course consists of group exercises.

Duration

20 hours over 2.5 days.
This includes examination and assessments.

- Determine effective assessment methodologies
- Organise, administer and conduct an onboard assessment.

Putting learning into practice

The course familiarises the trainee with the basic structure of certification embodied in the STCW Convention that emphasises competence-based assessment on board ships. The objective is to allow trainees to gain an insight into the value of practical training during seagoing service performed on various voyages in different types of ship, and how competency gained from such training can be assessed. The knowledge, understanding and proficiencies that are required of shipboard assessors include:

- Awareness of the value of training and assessment
- Substantive subject matter knowledge
- Assessment skills
- Diagnostic and managerial skills
- Appropriate attitudes to training and assessment.

Learning style

The Onboard Assessment Course is theory-based with guided practical exercises that introduce the trainee to various scenarios. As with all of The Nautical Institute's courses, the learning style is interactive and requires a high level of participation from attendees.

On the principle that people learn best by 'doing' and recognising that for some trainees English is not a first language, this course contains an equal split between group work (including case studies) and lecture material. The course instructor may substitute group exercises if the learning objectives can be best achieved by group work and discussion.

Courses will generally have no more than 12 participants, and exercises should be carried out in groups of four or five people. A spokesperson/team leader for the group is appointed during group work sessions and will be responsible for presenting the conclusion of the team to the other participants. The role of the spokesperson/team leader is rotated during scenarios.

Final assessment

The final assessment process must ensure that trainees meet all minimum national and international requirements regarding onboard assessments. Assessments are carried out individually, and include:

- Participation in practical exercise scenarios during the course
- Successful completion (during the course) of theoretical exam.

While the course aims at familiarising trainees with the various methods that may be used to assess the competency of trainees on board, it is essential that practical experience is gained under the supervision of an experienced shipboard assessor.

For more information, and to find out when courses will take place in your region, please visit www.nautinst.org/courses

Mariners' Alerting and Reporting Scheme

MARS Report No. 313 November 2018

MARS 201869

Lifeboat falls with one fatality

Edited from official BEAmer (France) report, May 2017

➔ On a passenger vessel, two members of crew were preparing a lifeboat for lowering as a drill. The lifeboat's doors were opened and the two locking pins were inserted in the dedicated slots. The lifeboat was lifted slightly from the stowed position so that the forward and aft lashing gripes could be retracted. The aft lashing lever was released by one crew member and the lashing gripe retracted normally. The other crew member was busy disconnecting the battery charging supply cables and checking that the engine was ready to start. Somehow, both crew forgot about the forward lashing lever. It remained in position and thus the bow of the boat remained secured.

Soon afterwards, other crew members arrived to assist in the lowering: five to man the boat and one to lower the boat. The crew member who was to lower the boat did not visually check the fore part of the boat. He released the winch brake, and the stern of the boat immediately started to descend, but the bow was locked in the guide by the forward lashing gripe. The lifeboat was destabilised and tilted heavily backwards. Under the combined effects of the excessive inclination and the weight, the bow of the boat freed itself from the guide and the forward long-link slipped out from its release hook. The lifeboat tilted heavily forward, creating a new imbalance. The aft long-link in turn slipped from its hook, tearing its stop pawl. The lifeboat then fell into the sea with a forward tilt angle.

Due to the force of the impact, the forward hook-man was fatally injured. Two other crew were seriously injured and two more sustained minor injuries.

Similar lifeboat: 370 person capacity

Lessons learned

- Lifeboat accidents continue to happen despite the introduction of gear incorporating extra defence mechanisms to help prevent falls. Human error is still a major contributing factor to lifeboat accidents.
- When performing lifeboat lowering manoeuvres it is vital to follow procedures strictly.
- If the lifeboat lowering crew cross-check procedural steps, they are more likely to catch mistakes before negative consequences occur.

MARS 201870

Mooring line snapback causes one fatality

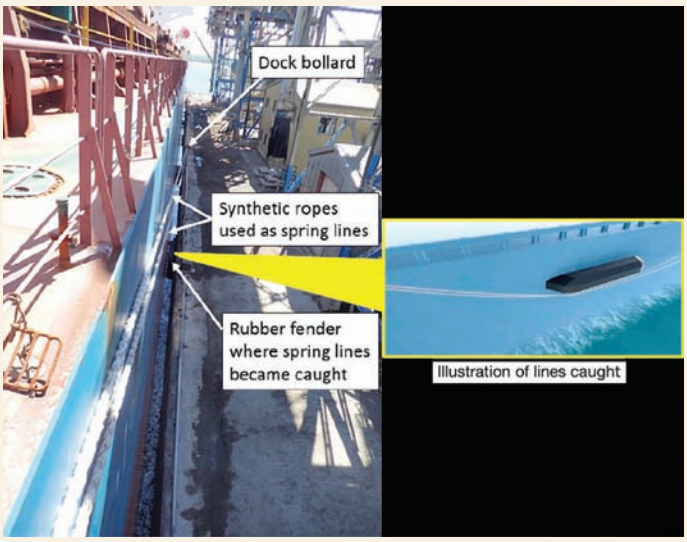
Edited from official TSB (Canada) report M17C0060

➔ A vessel was in the final approach to mooring, parallel to the berth, and two tugs were ordered to push against the vessel's hull. The forward mooring party had deployed two spring lines, which were both placed on the same bollard by the linesmen. The lines were passed through different fairleads on the port bow and winched by the vessel's port mooring unit on the inner and outer drums.

Initially, the two lines were kept loose between the dock and the vessel, as the ship had not yet reached its final position. Once in position, the Master ordered the officer in charge (OIC) to tighten the spring lines to keep the vessel in place. Both spring lines were pulled taut with the port mooring unit, stopping the vessel's motion. The two tugs were continuing to push on the vessel so that it maintained contact with the rubber fenders dockside.

The spring lines were under increasing tension, and the linesmen heard the typical sound of synthetic ropes being stretched. The linesmen noticed that the mooring lines were caught on a fender, and were not leading in a straight line from the vessel's fairleads to the dock bollard as they would normally. They informed the ship's bridge team by VHF radio.

The information was relayed to the OIC. He leaned over the vessel's side to assess the status of the mooring lines and then ordered the mooring party to heave on the winch to put more tension on the lines. The pilot ordered the forward tug to stop pushing. A few seconds later the vessel's bow started to shift sideways and away from the dock's fenders. One of the linesmen on the dock shouted to back away from the handrail. The OIC moved back for a few seconds, but then came forward and leaned over the handrail again to look down at the point where the spring lines were catching.



Suddenly, the two spring lines came free of the fender and sprang upwards like a slingshot. One line went well above the handrail, hitting the OIC on the chin. He fell unconscious to the deck.

Although the victim was quickly brought to the hospital after the accident he succumbed to his injuries and was pronounced dead.

Lessons learned

- This incident is testament, once again, to the dangers of mooring work. Be aware of your environment and the potential hazards.
- The energy within mooring ropes can easily injure or kill. Always use extreme caution when working within the mooring area, even if snapback areas are undefined.
- If there is no clear, unimpeded path from fairlead to bollard, do not increase tension. Slack or hold until the obstruction has been cleared.

MARS 201871

A mouthful of chemical will not slake your thirst

➔ A junior officer was assigned to clean a lifeboat during dry docking. He took a small amount of tank cleaning chemical in an empty plastic mineral water bottle for the task. Because there were no drinking water arrangements available at the jetty, he also carried with him some drinking water in a similar bottle. The two bottles were unmarked except for the water brand label; both liquids were clear.

While cleaning the lifeboat the officer picked up one of the bottles, assuming it contained the fresh water and took a drink. However, it was the tank cleaning chemical and not the water. As soon as he realised this, he spat it out immediately. He soon started getting an irritation in his mouth and throat, which persisted for some time. He was given immediate first aid and was later taken to hospital for further checks and medical attention.

Lessons learned

Chemicals are often ordered in bulk quantities that are inconvenient or unsuitable for everyday use. Subsequently, the chemicals may be transferred to smaller containers that are easier to manage. If it is necessary to transfer chemicals from their original containers:

- Always transfer the chemicals in the chemical storage area
- Use a container in good condition and of the appropriate type for the chemical
- Ensure that the containers are clearly labelled. The labels should be clean and legible and should include: full product name, manufacturer name and material safety data sheet (MSDS) reference.

Never use drinking water bottles for the storing/transferring of chemicals.

Tank cleaning chemicals should not be used for cleaning lifeboats.

■ **Editor's note:** This type of mishap may be more common than one would think; see MARS 201816 for example.

MARS 201872

Blown sideways and then collision

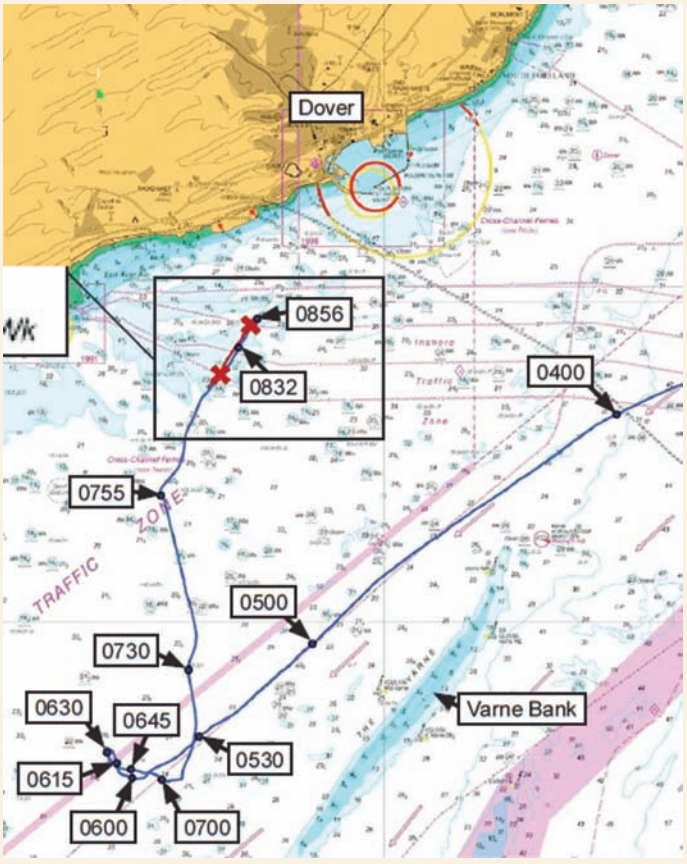
As edited from official MAIB (UK) report 3/2018

➔ A general cargo ship was sailing in ballast and had passed through Dover Strait in the south-west traffic lane. The weather had deteriorated significantly with the approach of a strong storm, and the south-westerly wind and tidal stream substantially reduced the ship's progress. The Master attempted to counter the effects of the weather by increasing main engine speed, but this resulted in the ship pitching heavily. The pitching, coupled with the ballast condition, allowed the propeller to come clear of the water, causing the main engine to overspeed and shut down. This happened on several occasions, but the engineers were able to restart the engine promptly each time. The Master then realised it would be better to turn around and have the seas behind, so he attempted to turn the ship to starboard and steer a reciprocal course until the storm abated.

During the attempted turn, the vessel came beam-on to the sea and began rolling heavily. The effect of the wind on the ship's structure overcame the turning moment of the rudder and made it impossible to complete the turn. Despite maintaining propulsion, the vessel was blown broadside over more than 7nm while the Master continued to try to turn the vessel to starboard. The Master had considered deploying an anchor but thought that conditions were such that it was unsafe to allow an anchor party to operate on the forward deck.

Finally, as the vessel drifted closer to shore and towards a rock barge that was anchored nearby, the vessel's crew deployed both anchors. By now the vessel had gathered considerable sideways speed and was drifting near 9kt, so the anchors did not hold. To add to the confusion the rock barge was also dragging anchor. Both vessels dragged their anchors over two subsea cables, which were severed as a result.

The general cargo vessel collided with the rock barge. At this point, the vessels remained locked together but stopped dragging anchor.



Lessons learned

- Good seamanship is, in part, anticipating weather and acting before conditions deteriorate.
- If severe weather impedes progress, good seamanship usually means having to heave-to and ride out the storm. It can also include deploying one or more anchors to supplement the ship's propulsion in overcoming the effect of the weather.
- From this report it is unclear what specific manoeuvres with helm and engine the Master was using to attempt to turn the vessel. Using robust astern thrust will often help bring the stern into the wind.

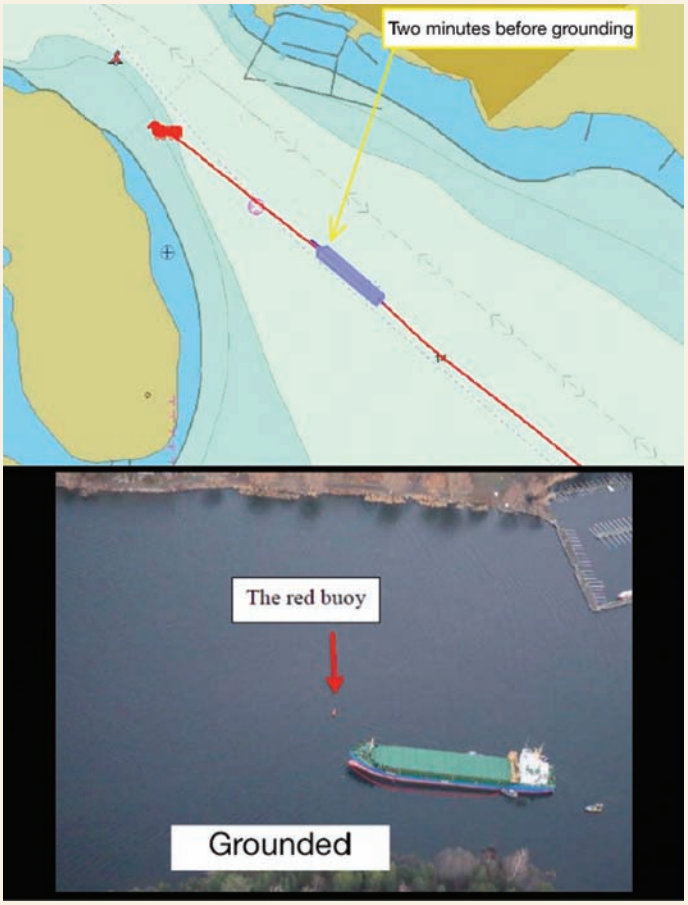
Collision damage with rock barge

MARS 201873

No charts, no plan, no BRM, little rest = grounded

Edited from official SHK (Sweden) report RS2017:05e

➔ A small bulk carrier was loaded and underway under pilotage in coastal confined waterways in the early morning hours. The pilot had his portable pilot unit (PPU), which was loaded with the applicable charts for the voyage. The vessel, however, did not have the paper charts on board for that area, nor was the vessel equipped with an ECDIS.



The bridge was manned by an OOW and the pilot. At 04.31 the pilot informed the OOW that about half an hour remained before they would reach their destination; the Master came back up on to the bridge at about this time. The pilot set the course to 309° on the autopilot, steering in the direction of the red buoy ahead, which was the location of the next course alteration to port. The pilot began reducing speed and simultaneously switched over to manual steering. After a few minutes the pilot discovered that the vessel was on the wrong side of the buoy. He was not able to turn, but stopped the engine before the vessel ran aground at about 04.50.

Among other findings, the official investigation learned that:

- The vessel lacked charts for the intended voyage, meaning that it was not seaworthy according to applicable regulations and the shipping company's ISM scheme.
- No voyage plan had been completed, which coincided with the lack of charts.
- Bridge co-operation (BRM) before the grounding was limited, with very little communication and no participation by ship's crew.
- At the time of the grounding it is probable that the pilot's level of alertness had been adversely affected by fatigue as a result of cumulative sleep deficit, the time of day, the long pilotage and the lack of opportunities for rest and recovery.

Lessons learned

- Do not undertake a voyage without the proper charts and a detailed voyage plan.
- Actively participate in pilotage: check the position, watch the helm orders, maintain situational awareness.

MARS 201874

Steam burn

➔ The crew of a tanker were undertaking cargo tank cleaning operations while at sea. Two boilers were in use. The deck steam valve in the engine room was unintentionally opened far more than the required 20–40%. This resulted in a surplus of steam and decreased the water level in the boiler. The feed pump started (in auto mode) to replenish the water in the boiler, which in turn created a low level of water in the hot well.

Due to the surplus steam, the return line was filled with a volume of steam that exceeded the condenser capacity. Steam filled the condenser and subsequently escaped into the hot well. Low level alarms were activated on the boiler and then in the hot well. Working in haste, the EOW was focused solely on the boiler low level alarm and did not check the level gauge for the hot well tank before opening it. The steam and water mixture in the hot well splashed on to his feet, causing a severe burn on his lower left leg.

The victim had to be repatriated for final recovery.

Lessons learned

- Mistakes made upstream of a process may have serious unintended consequence later and at point downstream in the process.
- Try and keep your overall situational awareness about you when undertaking a specific task.

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Unsafe crane operations

Working safely is sometimes heavy going

Captain Hemant Gupta AFNI
Founding committee member, Singapore branch of The Nautical Institute

Over the past 25 years, first as officer and Master on cargo vessels and now as head of port operations for a major port, I have seen my fair share of risks taken, close calls and accidents. I would like to share some examples of lifting manoeuvres (or attempts) that defy many of the precepts of good seamanship or even good judgement and common sense.

More often than not, it would appear that commercial interests and time pressure conspire to warp the judgement of the persons involved. Had they taken a step back and considered the risks versus the gains, it would be self-evident that the task should be stopped and re-evaluated.

Protests sometimes meet commercial pressure from charterers or are rebuffed with the claim that things are 'always done this way'. However, it is always worth protesting – even if that may mean the job has to be abandoned should no safe solution be found.

Using one shore hopper for two ship cranes

The stevedores wanted to deploy four gangs to discharge, using all four vessel cranes. Since the port had only three hoppers to land the cargo it was decided to start discharging using two cranes with two separate hoppers. The remaining two cranes were to discharge cargo into the remaining single hopper.

As Master, I protested against the use of two cranes for one hopper, because of the risk of collision between the cranes. The stevedores would be focused on expediting the operation rather than on safety. The port replied: 'We have always done this and no vessel has raised any concerns before,' and exerted considerable pressure on the vessel through the charterers. I refused to allow such risky operations and the stevedores had to reduce from four gangs to three.

Two ship cranes for one hold

Where the remaining cargo is in a single hold, one of the parties may insist on using two cranes, one fore and one aft, to increase the discharge rate. Although this makes commercial sense, this operation is risky because it may lead to the two cranes or the cargo being discharged, making contact.

The consequences can be serious, including fatalities and severe damage to vessel cranes and/or cargo. As Master, I occasionally received such requests from stevedores, ports and charterers. I even received letters of protest for impeding the efficient discharge of cargo. It is never worth compromising the safety of the vessel for the sake of commercial pressure.

Swinging the grab to load the cargo

The stevedores were using a shore mobile crane to load grain, but the crane radius was insufficient to reach the outboard side of the ship's hold. The stevedores were adept at swinging the grab by lowering/heaving the crane boom, then opening it when it had swung sufficiently to reach the outboard side.

The port was astonished when I objected. In my protest, I pointed out that the shore crane (or the vessel) could be damaged by swinging the grab in this way. They could not see why the Captain should be concerned when it was not the vessel's cranes being used. I stood my ground, and we used the vessel's crane to complete the loading even though the stevedores protested that this slowed the process. From their point of view, the speed of loading was more important than safety.

Exceeding the SWL

On a heavy-lift vessel, the cargo was to be lifted by two of the vessel cranes in tandem, each crane having a safe working load (SWL) of 500 tons. The cargo to be lifted was 1,050 tons. The owners had taken a special exemption from class for the overloading operation. The Master explained that the exception was granted via email and is not uncommon for heavy-lift vessels. However, the class surveyor did not carry out a thorough examination before the exemption was granted.

Since class had approved it, I allowed the cargo to be loaded but insisted the Chief Officer carried out a thorough examination of the cranes and that the Master gave a written statement indicating the cranes had been thoroughly inspected before the lifting began.

Doubtful cargo weight

A cargo enclosed in wooden packaging, with dimensions of 15m x 0.4m x 0.4m, had been loaded by a shore crane and was to be unloaded by the vessel's crane. The cargo was said to weigh 49.5 tons. The crane's SWL was 50 tons.

As head of port operations, my first question was whether the packaging was strong enough for the lift. Another concern was that there was no indication of the CG. The Master and chief officer did not know the SWL of the shore crane used for loading or what slinging method had been used. Nor did they have any documents to validate the weight of the cargo or the exact position of the CG.

The Master was not interested in my concerns, stating that vessel crane had a 50 tons capacity and the stevedores were responsible for discharging the cargo safely. When I explained that the stevedores were in legal terms a 'servant of the Master' and work under the direction of the Master, he simply repeated himself.

When the port still refused to discharge the cargo by vessel crane, the Master admitted that he understood my concerns. He explained that he was worried that the vessel crane would be damaged as it was not in top-notch condition and the cargo may have been more than 50 tons. He agreed with my suggestion to use a port shore crane (of 100 tons capacity) with extra slings to support the base of the over-length cargo. However, charterers refused to pay for the shore crane, claiming that the vessel crane had 50 tons capacity, which was sufficient.

The port had little choice but to accept the use of the vessel crane. However, to avoid any claims in case of an accident, the port insisted that the crane not be handled by the stevedores. Charterers insisted on

using vessel crane and stevedores. Operations were stopped as the port insisted on its safety stand.

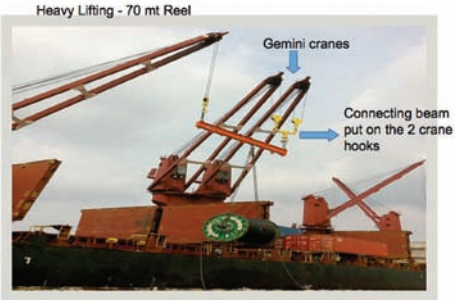
After almost 24 hours, and since the berth was soon required for another vessel, the port proceeded with discharge using the shore crane and taking the precaution of using extra slings of much higher SWL.

Offset of CG

A symmetrical cargo of 70 tons was to be loaded using a single crane of 31 tons SWL and a set of Gemini cranes of 25 tons SWL each, giving a total of 81 tons. Port representatives refused to proceed with the lift as there were too many variables and an insufficient margin of safety. For example:

- The cargo could only be loaded by uneven distribution of cargo weight between the two sets of cranes (offset CG method).
- The cranes had not run in Gemini mode for the last year, so there were concerns about synchronisation. Poor synchronisation can result in the connecting beam being tilted.
- The overload limit switches on the cranes had not been tested.

The port allowed the lift, but only once the crane limit switches had been tested by a shore-based crane engineer, who then monitored the operations throughout. The cranes were also tested in Gemini mode and a trial lift to check for proper synchronisation. The port refused to use its own stevedores, to avoid any claims in case of accident, and the lifting was done by the vessel crew.



After the operation was complete, I advised the Master to be equally careful at the discharge port and that he should not accept such operations in the future.

No safety margin

A small boat, said to weigh 133 tons, was to be loaded as cargo from the water using two vessel cranes in tandem lift mode. The two cranes had the same SWL, which varied according to the radius being worked. The boat was being lifted by offset CG method.

Well before the full weight of the boat was on the cranes, the overload limit switches of both cranes activated and the cranes stopped. The operation was aborted and the crane manufacturer was called to rectify the defective limit setting.

By the time the operation was resumed, the lifting plan had been changed, and now showed the weight of the boat as 150 tons. One of the cranes was again stopped as its display showed 89.5 tons (SWL for that radius was 80 tons). The stevedores again aborted operations, expressing concern that:

- The SWL of the crane had been exceeded
- The cargo was lop-sided. One crane showed 89.5 tons and the other showed only 11.5 tons. It was therefore understood that the CG was not in the assumed position.

The vessel's supercargo wanted to continue, using the vessel's crew to operate the cranes. The port would not allow the operations to be resumed unless the problems were rectified. In a meeting with the vessel's supercargo, Master, charterers and the engineers from the crane manufacturer, the port:

- Expressed concern that the crane indicator was faulty, making it impossible to know the exact radius of the cranes. This was critical, as the crane was expected to be at the limit of its SWL for the various radii during the operations.
- Queried the change in the weight of the boat and asked that a draught survey be done to calculate the present light vessel displacement, as the vessel was 25 years old. A surveyor was also asked to confirm that all the fuel and water had been removed from the boat.
- Requested a 10% safety margin due to the error in CG position and other variables.

The vessel's supercargo, an experienced Master mariner, insisted that a 10% safety margin was already built in, as the cranes had been load-tested a year ago. The radius of the two cranes (and therefore their SWL) was to change once the cargo was lifted from the water in order to load it as planned (due to the stowage, the boat could not be loaded at any other point). The port reasoned that both the lifting plan and the plan showing the crane radius on the load chart had to have a 10% safety margin during the entire lifting operation.

Charterers, vessel's supercargo and vessel crew believed that the port's demands were excessive. Ultimately, the vessel was unable to meet the requirements and the port did not allow the lifting to proceed. The vessel left port without loading.

Whether ashore or on board, if you think something is amiss, speak up. Don't let commercial pressures affect your better judgement. Working safely is sometimes heavy going, but it is well worth the effort.

Some basic best practices when lifting

- Cranes should never come so close to each other that they collide, as this will damage the crane and could cause injury. Each crane should have a dedicated hopper to discharge cargo. Two cranes should not share the same hopper.
- The crane hook must not be swung to reach the cargo. If the cargo to be loaded is beyond the crane's reach, equipment like bulldozers or excavators should be used to move the cargo to the end of the hold;
- Some cranes have a fixed safe working load (SWL) throughout their working radius whereas for others the SWL varies according to the radius at which the crane is working.
- The SWL should never be exceeded except in the instance of load testing or, of course, in an emergency to save life.
- Vessel cranes are load tested every five years. The crane is tested at 110% of its SWL for a few minutes. The crane is tested by holding the weight in static mode and it does not perform any slewing/luffing or hoisting during the load test.
- Before carrying out the load test, the competent officer on the vessel should thoroughly inspect the crane. The surveyor who attends the load test should also inspect the crane before beginning the test. The surveyor inspects the crane again once the weight has been removed.
- The centre of gravity (CG) of the cargo should always be known and indicated.
- Sometimes, cargo is lifted by two cranes together in a 'tandem lift'. Where two cranes of different SWL are required to lift a single cargo parcel, the CG of the cargo is not kept exactly between the two crane hooks. Instead, it is offset, so that the heavier crane bears more weight of the cargo (known as offset CG method).
- Some vessels have two cranes on a single foundation, sometimes referred to as Gemini cranes. These cranes can be combined into a single crane with a connecting beam joining the hooks. This will give an SWL that is double that of the individual cranes. One crane is the master and the other is synchronised or 'slaved' to it. However, cranes in the Gemini arrangement are rarely 100% synchronised. Usually the connecting beam put on the hook of the cranes to join them is somewhat tilted when cargo is lifted.

Reality check

Safe handling of solid bulk cargo

Kevin Cribbin Master Mariner FCIS G.IOSH MNI
Director, Vistrato Ltd

A review of accident investigation and media and other reports identified 81 accidents on ships carrying solid bulk cargoes that have resulted in the deaths of some 113 people between 1999 and September 2018. An estimated 94 of those died from asphyxiation in cargo holds or adjacent spaces and 19 died in cargo-related explosions. Many more were injured, with a significant number suffering brain injury. Of those who died, 73 were seafarers and 40 were shore workers.

At least 33 people died in cargo-related accidents aboard ships at sea, while some 64 people died on ships in port. (Details provided in many accident reports are incomplete so it is not possible to determine all relevant data.) An estimated 62 of those died doing unloading operations while two died during loading operations.

Cargo hold access ladders – the most dangerous place on a ship

Of the 94 people who died as a result of oxygen deprivation, 78 died on hold access ladders or in hold access trunks. Another 16 people died in cargo holds and adjacent spaces. The cargoes involved were all covered by the IMSBC Code, apart from three accidents involving oxygen depletion in holds containing grain cargoes. These three accidents resulted in eight deaths.

Explosions and fires

Explosions in cargo holds resulted in 15 fatalities, while four people are reported to have died in explosions in the adjacent forecastle and mast house. Over this period 14 cargo fires were identified, none of which resulted in any fatalities.

Cargoes involved

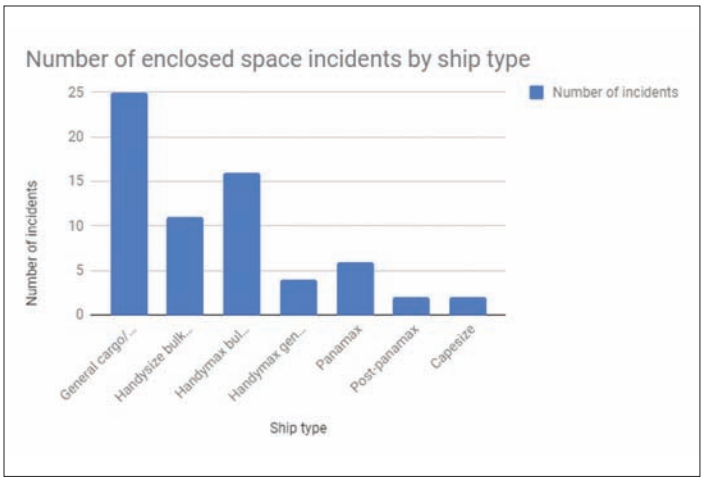
Of 75 accidents in which the cargo involved could be identified, the two biggest killers proved to be Group B cargoes – Coal and Wood Products (General). Together, these two cargoes were jointly responsible for more than 50% of both accidents and fatalities.

Other organic Group B cargoes involved in accidents included wood pellets, wood chips and seed cake. Non-organic materials included all three categories of direct reduced iron (DRI), zinc skimmings, petcoke, steel turnings, copper concentrate and zinc concentrate.

Group C cargoes involved in accidents included cargo described as 'scrap metal' and ammonium nitrate-based fertiliser. Accidents were also associated with cargoes not listed in the IMSBC Code, such as palm kernel shells, nut shells and incinerator bottom ash.

Ships involved

Of 67 ships identified, 25 accidents happened on general cargo/multi-purpose ships, 11 happened on handysize bulk carriers and 16 on handymaxes. Four happened on handymax general cargo ships (forest product carriers), seven on panamaxes, two on post-panamaxes and two on capesize bulk carriers.



The raw data indicates that small general cargo ships such as coastal bulkers are more likely to be involved in accidents involving solid bulk cargoes than any other type of bulk carrier.

Gasses involved

Of the 11 cargoes involved in oxygen depletion accidents, seven of them are organic materials listed in the individual schedules in the IMSBC Code as likely to emit carbon dioxide, an oxygen-depleting, toxic gas.

Carbon monoxide is also both oxygen-depleting and toxic, but is only listed as likely to occur with coal and wood pellets. The other four non-organic materials are described as subject to oxidation, self-heating, oxygen depletion and the emission of toxic fumes. No details have been provided as to which gases are likely to be emitted.

Apart from three DRI explosion accidents in cargo holds that occurred in the early 2000s, the other four explosions about which information is available were initiated by crew activity in adjacent forecastle stores, a mast house and on deck. All eight explosion accidents involved cargoes that emitted hydrogen gas, with coal being the only one listed as emitting both hydrogen and methane. Both gases are lighter than air, colourless, odourless, flammable and explosive and will find their way through any connecting openings between cargo holds and adjacent spaces.

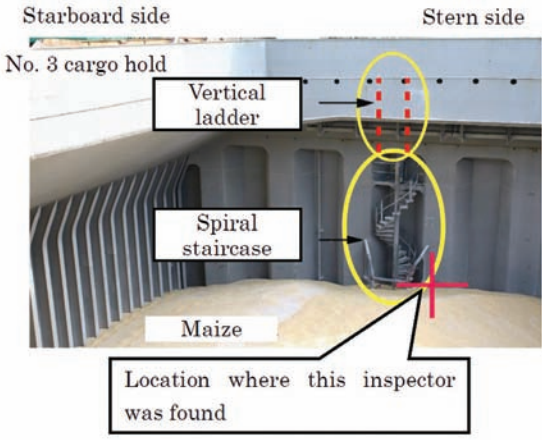
Gas detection

In compliance with IMO guidelines, ships typically carry the standard four gas detectors for testing for oxygen, flammable gases (such as methane), carbon monoxide and hydrogen sulphide. These detectors cannot detect carbon dioxide and may not be capable of detecting hydrogen.

As the guidelines also state that additional appropriate instruments should be carried if other atmospheric hazards are likely to arise, and as CO_2 and hydrogen appear to be linked to many accidents, then the use of CO_2 and hydrogen detectors should be considered when cargoes likely to emit these gases are proposed for carriage.

Case study

- Supramax bulk carrier discharging grain cargo
- Hatch cover was open, unloading in progress for 20-25 minutes
- Inspector entered hold, without authorisation, to take cargo samples
- He appears to have collapsed almost immediately and died shortly afterwards
- It is probable that oxygen levels in head space above the cargo at the aft end of the hold were depleted by CO_2 emitted by the cargo.



Risk assessment – the 4 'i's

The fundamental requirement when planning to load a solid bulk cargo is to carry out a risk assessment and to keep it updated during the course of the voyage, before starting to unload the cargo and before anyone attempts to enter a hold.

A risk assessment consists of four steps:

- identify the hazards
- identify and assess the risks
- identify the controls
- inform all those at risk – specifically crew members, stevedores and cargo surveyors.

Wood product cargoes are a dangerous combination that is too often overlooked. (MV "Suntis", BSU)

Information

The quality of the risk assessment depends on the quality of the information on which it is based and on the systematic evaluation of that information. The required hazard information and other relevant guidance is provided in the individual schedule for the cargo in the IMSBC Code and in the Shipper's Form for Cargo Information.

The Shipper's Form must be provided to the Master in advance of loading and gives current, up-to-date information on the cargo to be loaded. Where the cargo is not listed in the code, the information and guidance provided in the certificate issued by the port of loading should be used. Relevant information may also be available in the SDS for the material, if provided by the shipper. Proper account also needs to be taken of the design and layout of the ship's cargo holds, hold ladders and adjacent spaces.

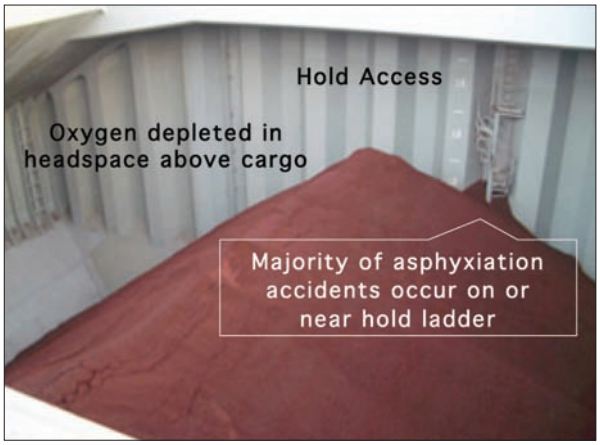
Alarm bells

If initial assessment indicates that the cargo is Group B, then alarm bells should ring. Hold access hatches should be secured immediately and warning labels posted to prevent unauthorised or accidental entry. All cargo spaces containing solid bulk cargoes should be considered hazardous until confirmed safe for entry.

Trends

With at least 12 asphyxiation fatalities and one explosion fatality reported to date, 2018 is going to be one of the worst years ever for solid bulk cargo-related accidents. The worldwide trend is upward, with asphyxiation-related fatalities involving ship and shore workers reported during the discharge of coal in ports in Sweden and India, timber cargoes in Germany and Brazil, and palm kernel shells in Indonesia. One crew member is also reported to have been killed in an explosion in the hold of a ship carrying coal. There have also been reports of cargo fires (animal feed) on one ship at sea and on four ships in European ports (two coal and two scrap).

It is imperative that the Master or responsible officer carries out a systematic risk assessment every time a solid bulk cargo is due to be loaded, carried and unloaded on any ship. The Master, as the person charged with responsibility for the safe operation of the ship and for the safety of all persons on board, must ensure that this is done thoroughly and carefully – and the guidance provided in the IMO's 'Revised recommendations for entering enclosed spaces aboard ships' complied with – if this continuing needless loss of life on board ships carrying solid bulk cargoes is to be prevented.



This article first appeared in the IFSMA newsletter. It is based on research carried out by the author and includes unverified information from various sources regarding accidents for which official accident investigation reports have yet to be published or could not be found.

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The plastic epidemic

Captain Naveen S Singhal MNI

Plastic bottles and trash are littering the oceans and land, poisoning the environment and humans. What we can see is just a small fraction of what's really out there. However, the warning signs are clear enough. National and international administrations and marine regulators need to act promptly to prevent this plastic menace from causing permanent damage to both the marine environment and seafarers' health.

According to a BBC report, about 8 million tonnes of plastic enter the oceans each year. If deposition continues rising at current rates, the annual total could reach 17.5 million tonnes by 2025.

In response, the European Commission has proposed a European Union-wide rule that will target the sort of single-use plastic products that are often found on beaches and in seas. It plans to roll this out before the EU elections in May 2019.

If approved, the rule will put the EU in the lead for reducing plastic waste, in line with the global implementation of the United Nations' 17 Sustainable Development Goals. Most EU members agree that regulation is urgently needed to turn the tide of plastic.

Scale of the problem

In 2016, an IMO review of the current state of knowledge regarding marine litter in wastes dumped at sea under the London Convention and Protocol stated: 'the presence of heavy litter in the deep sea is considered an index of shipping traffic, an important sea-based source' (Ramirez-Llodra *et al*, 2013). According to the report, bottles account for more than 70% of plastic litter on continental shelves.

Figures from the International Bottled Water Association show that only 23.4% of plastic bottles are recycled. The remaining 76.6% of bottles are therefore left to cause an unassessed environmental impact in an open environment.

The weight of an empty bottle is about 12.7g. If we assume a modest consumption of 24 bottles of water on a vessel per day, the plastic bottle waste generated by one merchant ship would be 305g per day or 110kg per ship per year. The estimated 50,000 SOLAS ships worldwide would therefore be responsible for 5,500 metric tonnes of plastic bottle waste a year.

The website cruisemarketwatch.com estimates approximately 26 million passengers travel annually on cruise ships. The cruise fleet of 314 vessels with 537,000 passengers at any given time could be generating an estimated 2,400 tonnes of plastic bottle waste each year. Merchant and cruise vessels combined generate approximately 7,900 metric tonnes of plastic waste from bottled water alone.

If we assume that just 5% of these water bottles are disposed of overboard, either intentionally or inadvertently, in contravention of MARPOL Annex 5, ships will be contributing 395 metric tonnes of plastic to the oceans every year. Scientists now agree that this plastic causes considerable harm to marine species that consume it, both directly and further up the food chain.

Health issues

Plastic waste has serious implications for human health too. Christiana Z Peppard PhD, professor of theology, science and ethics at Fordham University, New York City, estimates that six out of seven plastic bottles used in the USA are 'downcycled' – that is, sent somewhere out of sight and out of mind, often in less developed countries. Unregulated dumping results in plastic containers degrading and entering watercourses. Plastic debris degrades soil and deposits toxins that will affect future generations.

Even where bottles are responsibly recycled, those consuming bottled water have reason to be worried. Plastic molecules can break down and shed chemicals such as phthalates and bisphenol-A. Scientists have warned about the effects of these chemicals on human health. In water, plastic attracts other chemicals that latch on to it, including toxic industrial compounds such as polychlorinated biphenyls (PCBs).

Research results indicate that, by and large, tap water is much safer than bottled water. A study commissioned by Orb Media, a US-based non-profit organisation, tested 250 bottles of water in the United States, Brazil, China, India, Indonesia, Kenya, Lebanon, Mexico and Thailand. Plastic was identified in 93% of the samples, which included major brands such as Aqua, Aquafina, Dasani, Evian, Nestlé Pure Life and San Pellegrino. Other brands found to be contaminated with plastic included Bisleri, Epura, Gerolsteiner, Minalba and Wahaha.

The extent of risk to human health posed by such contamination remains unclear. However, some research findings indicate an increase in certain kinds of cancer, lower sperm count and increases in conditions such as autism.

Implications for shipowners

With a seafarer strength of about 25 on each cargo vessel, a company is likely to spend roughly US$10,000 per ship per year on bottled water and another $4,000 per ship per year to dispose of the empty bottles. For a fleet of 10 ships, the annual cost of purchasing and disposing of water bottles would be $140,000 – a sum that could cover the cost of conducting three interactive crew training seminars. In the next few years the cost of disposal is certain to rise sharply as more countries implement strict anti-plastic regimes.

Shipowners and managers are beginning to take steps to mitigate the risks – environmental, health and financial – associated with the use of bottled water on board.

Capt Surendra Dutt, COO of Anglo-Eastern Group, Hong Kong, says that the group is fully committed to cutting down on single-use plastic water bottles. An ongoing campaign to highlight the health and environmental hazards posed by single-use plastic is edging the group closer to the goal of a plastic-free ship. With this increased awareness at the seafarer level, Capt Dutt is confident that Anglo-Eastern can improve its environmental performance and realise its sustainability vision.

Japanese shipowner NYK has installed special filters for drinking water on board all its ships. Members of ship staff consume filtered water from designated drinking water tanks. Hemant Pathania, Managing Director and COO NYK Ship Management Pte Ltd, Singapore, believes this both ensures healthy water for crew members and contributes to a better environment by reducing plastic waste. The initiative has also produced financial savings on the procurement and disposal of plastic mineral water bottles.

John Dama, Marine Manager at offshore operator Sapura Energy in Australia, explains that bottled drinking water on offshore vessels is not only an environmental concern but also poses risks for crew. To avoid potential issues with dumping plastic bottles, the company decided to provide and improve conventional fresh water supplies from vessel systems. Regular tank cleaning and water testing were implemented. Each crew member was given a stainless steel drinking bottle that they could refill with water from the dispenser. Initially, there were fears that drinking bottles might become contaminated through contact with the water dispenser's nozzle. This was resolved by redesigning the dispenser so that it issued the water in a stream, thereby avoiding contact between the nozzle and the bottle rim and eliminating the risk of bacterial transference or infection.

Dama says the benefits of doing away with bottled water were well worth pursuing. The company was unsure how crew, clients and unions would react, but the risk paid off beyond expectations. Sapura Constructor has embraced the system as a significant environmental improvement, and seafarers' unions and Australian maritime authorities have supported the initiative.

Possible shipboard solutions

The above examples show steps that have been taken to reduce the use of bottled water on board ships. Companies looking to move in a similar direction might consider some of the following approaches.

Technical:

- Fit reverse osmosis water desalination plants on ships
- Mineralise generated water
- Ensure that the piping system from designated fresh water tanks to dispensers is in good condition (change to heat-resistant polymers)
- Regularly clean designated fresh water tanks
- Provide ships with testing kits to test water
- Post the test results each week on ships' noticeboards.

Psychological:

- Visiting office staff should lead by example by consuming the same tank water as crew members use
- Educate seafarers on the health issues and environmental damage associated with *single-use plastic* water bottles.

Regulatory:

- IMO to bring the onboard generation, storage, purification, test reports, piping system and dispensers under a regulatory scheme. This could extend to the supply of fresh water to ships by port establishments and agencies.

A regulation to curb the menace of single-use plastic bottles at the 'generation stage' – that is, the procurement and consumption of water in plastic bottles – is increasingly becoming necessary. Guidance and control measures on potable water, tanks, piping, purification, testing and dispensing would make this a robust process. This would be in the interest of seafarers' health, their wellbeing and that of the environment as well.

Shipowners are obliged to provide clean potable water, under ILO-MLC-2006, paragraph A-3.2. Most will gladly adopt these changes to reduce the financial burden of purchasing and disposing of plastic bottles. Unlike the Ballast Water Management Convention (BWM), which took many years to come into force, this should be straightforward for IMO to implement.

When introducing the BWM Convention, the urgency was to protect marine species. Now, an amendment to MARPOL Annex 5 seems essential to protect seafarers and provide them with safe, healthy and plastic-free potable water. This becomes all the more necessary since IMO is a major partner in the UNEP-Managed Global Partnership on Marine Litter. The international community looks to IMO as the leader in finding solutions to shipping-related environmental concerns and seafarer health issues.

Captain Singhal is a Marine and QHSE Consultant, GRI-certified Sustainability Consultant, Six Sigma black belt and ISO Standards Specialist

David Patraiko FNI rounds up the latest news, releases and events affecting the maritime professional throughout the world

Cyber-security

IACS has published a series of recommendations on cyber safety, aiming to help ships maintain cyber resilience throughout their working lives. The recommendations are the result of a long-term initiative from IACS that has benefited significantly from cross-industry input and support.

IACS initially addressed the subject of software quality with the publication of UR E22 in 2006. Recognising the huge increase in the use of onboard cyber systems since that time, IACS has developed this series of recommendations to reflect the resilience requirements of a ship with more interdependencies. The recommendations address the need for:

- A more complete understanding of the interplay between ship systems
- Protection from events beyond software errors
- Appropriate response and recovery in the event of protection failure
- A means of detection so that the appropriate response could be put in place.

At an early stage, IACS acknowledged that if ships are to protect against cyber incidents, all parts of the industry needed to be actively involved. It therefore convened a joint working group (JWG) on cyber systems. An important part of the JWG's work has been identifying best practice and recognising appropriate existing standards in risk and cyber-security. Consequently, the recommendations provide both guidance on areas of concern and the building blocks for system resilience.

IACS Chairman Mr Jeong-kie Lee of the Korean Register stated: 'These 12 recommendations represent a significant milestone in addressing safety concerns related to cyber issues. IACS's focus on cyber-safety reflects our recognition that cyber systems are now just as integral to ship safety as its structure and machinery. IACS is committed to providing the industry with the necessary tools as part of our mission to deliver safer, cleaner shipping.'

IACS recognises that the delivery of these recommendations is only the beginning in a long fight to maintain the cyber integrity of vessels. However, the organisation remains confident that the structured approach being adopted positions it well to evolve these offerings responsively and in a manner that supports industry stakeholder needs.

More details can be found at: www.iacs.org.uk

Lessons learnt

Last year, the UK P&I Club loss prevention team launched the 'Lessons Learnt' project, which examines real-life case studies and identifies measures to help members avoid incidents. The reports, which have received excellent feedback from UK Club members, deal with a number of P&I-related incidents and are published regularly on the website. For accessibility, they are categorised under the headings Personal Injury, Cargo, Navigation and Pollution.

Each report is presented in the same format, with an incident description, analysis and lessons to be learnt. A distinctive feature of the project is that the reports are sourced from the club's own claims database and not from incidents already published by other industry bodies. For this reason, great care is taken to ensure that the reports retain their anonymity – ship names, geographical locations and other potentially identifying features are all omitted.

The project has now been developed further through the launch of a series of 'Lessons Learnt' training videos, which aim to provide an interactive learning experience for seafarers by examining incidents and their consequences. At the end of each educational video, seafarers are invited to reflect upon the lessons and identify how they could apply them to their own shipboard practices.

The first video release, 'Death of a Bosun', tells the tragic story of a mariner who died during a routine lifeboat drill as a result of inadequate working practices, poor supervision and maintenance issues.

The second video, 'Collision with a Fishing Vessel', explains how a bulk carrier, operating at night in good visibility and weather conditions, collided with a fishing vessel despite detecting it in good time.

The videos are available via the club's website, www.ukpandi.com. If you would like digital copies of the videos for training purposes, please email the Loss Prevention Department at: lossprevention.ukclub@thomasmiller.com

Garbage management

The International Chamber of Shipping (ICS) has recently published a new edition of its 'Guidance for the Preparation and Implementation of Garbage Management Plans as Required by MARPOL Annex V'. This second edition publication is intended to help shipping companies comply with the latest requirements of the IMO regulation regarding treatment and disposal of garbage from ships.

ICS Deputy Secretary General Simon Bennett said: 'Following the entry into force of some important amendments to MARPOL Annex V in 2017 and 2018 respectively, it is essential to provide updated advice to shipping companies on the latest requirements for ships to prepare and implement garbage management plans.

'While the vast majority of garbage found at sea originates from land, it is no longer acceptable, with very limited exceptions, for any merchant ship to dispose of garbage at sea because of the seriously damaging effects on the marine environment. As well as doing great harm to marine life and threatening biodiversity, dangerous toxins can enter the food chain, and ultimately be consumed by humans.'

Some of the latest changes to global regulation include amendments to make mandatory the environment-related provisions of the IMO Polar Code, which are applicable to Annex V. A definition for the new 'E-waste' garbage category is also included, along with a new format of the Garbage Record Book and a new criteria to establish whether or not 'cargo residues' are harmful to the marine environment.

For further information about the ICS guidance, please visit the ICS website.

A round-up of news and events from NI branches across the world. Send your updates to **gh@nautinst.org**

SOUTH WEST OF ENGLAND BRANCH

Visit to RFA *Tidesurge*

At the end of summer 2018, Branch members were invited to visit RFA *Tidesurge*, one of four new replenishment tankers built under the United Kingdom's former Military Afloat Reach and Sustainability (MARS) project.

The replenishment tankers, of 39,000 tonnes displacement and over 200 metres in length, have been designed by BMT Defence Services to replace the single-hull tankers previously operated by the Royal Fleet Auxiliary (RFA). They are designed to support all ships of the Royal Navy including the two new aircraft carriers that are being introduced into the fleet.

The RFA *Tidesurge* and her sister ships were built by Daewoo Shipbuilding and Marine Engineering of South Korea – a decision that caused some controversy – at a cost of around £450 million overall. Following the building and movement of the ships from Korea to the United Kingdom, the ships have undergone four months of military customisation at the A&P Group Falmouth, including the fitting of armour, self-defence weaponry and communications systems.

Nautical Institute members were welcomed at the gangway by Captain Robert Allan MNI OBE, who has been deeply involved in the acceptance of the new ships. Captain Allan described the role and purpose of the ships to Branch members over refreshments. This was followed by a visit to the bridge, engine control room, helicopter flight pad, galley and dining room, during which we enjoyed hospitality in the form of a fish and chip lunch.

Refuelling operations

The main purpose of the RFA *Tidesurge* and her sister ships is the supply of fuel for both ships and aircraft of the Royal Navy. They can carry 19,000m³ of ship and aviation fuel and 1,400m³ of fresh water.

Transfer to other ships is by means of three Replenishment at Sea (RAS) rigs positioned forward of the bridge, or by stern pipeline. The transfer of fuel and water is managed from a dedicated control room on the foredeck between the three rigs, two of which are located on the ship's starboard side and the other to port. Transfer can be undertaken underway at an impressive 2,000m³ per hour using both rigs, twin 7in hoses and fuelling probes. Fuel for transfer is stored in 17 independent dual-use tanks arranged within the double hull structure.

There is deck space for eight 20ft containers for other cargo. In addition to fuel transfer a limited amount of solid stores, such as drummed lubrication oil, can be transferred using a 'high point' heavy jackstay. However, the preferred method of solid stores transfer is vertical replenishment using helicopters.

Members of the South West Branch of The Nautical Institute on board RFA *Tidesurge*

Having a shipborne helicopter is important for more than just the transfer of cargo. The helicopter has many roles including anti-submarine work, tracking and surveillance of ships, support to amphibious operations, search and rescue and delivery of humanitarian aid.

The flight deck has the strength to carry a loaded Chinook helicopter (20 tonnes), but normally works with the smaller Merlin helicopter. A deck locking arrangement allows helicopters to operate from the deck of the ship in heavy seas without danger to flight deck personnel. An onboard hangar more than 23 metres in length and 6m in height permits the helicopter to be maintained at sea.

On the bridge

Bridge equipment includes the Kelvin Hughes Integrated Bridge System, with associated SharpEyeTM radars and an integrated platform management system (IPMS). The IPMS provides integrated monitoring and control of the ship's propulsion, electrical and auxiliary plant management systems. Among all the high-tech navigation and monitoring systems equipment, it was interesting to see that *Tidesurge* still carries the traditional hand lead line.

RFA *Tidesurge* is propelled by medium-speed diesel engines driving twin shafts and propellers in a hybrid CODELOD (combined diesel-electric or diesel) arrangement. The ships have a cruising speed of 15 knots and a range of 18,000 nautical miles, but the propulsion system is designed for fuel efficiency across a wide range of speeds. The bow thrust unit is unusual for a fleet replenishment vessel, as it can be lowered and rotated to provide emergency propulsion and steering. Captain Robert Allan said the sea-handling qualities and propulsion system of the ships were very good.

RFA *Tidespring* at Devonport Naval Base Plymouth following completion of military customisation

Life on board

The galley is large for the 63 permanent crew carried aboard – provision has been made for feeding a further 50 non-crew members embarked as Royal Marines, flight crew, trainees or in support of humanitarian missions. The ship is equipped with a three-bed hospital and a dispensary, operated by medically trained crew members. If circumstances demand, the officers' lounge can be converted to provide additional hospital accommodation.

Before departing, we made a return visit to the bridge, where thanks were expressed to Captain Allan and members of his crew who had accompanied the tour for providing a most interesting insight into the work of the new ships of the Royal Fleet Auxiliary. Thanks were also expressed to branch members Captain Richard Allan MNI and Captain Robert Hone FNI who had been involved in arranging the visit.

Paul G Wright MNM FNI

LONDON BRANCH

London Nautical School prizegiving

The London Branch of The Nautical Institute again sponsored awards at the annual prize giving at the London Nautical School, supporting maritime education and ensuring that young people are aware of the role of The Nautical Institute from the very beginning of their careers. Head master Andrew Bull remains passionate about the maritime industry and the benefits of the academic and practical nautical education that students receive at the London Nautical School, that enables them to achieve and develop life skills and potential career skills.

Award winners were:

- Freddy Bates – Nautical Institute Key Stage 3 award
- Eduard Carillo Mullo – Nautical Institute Key Stage 4
- Cameron Paris – Nautical Institute Trophy, Captain James Greig Award

Much of the credit for the success of the Nautical Studies department must go to teacher and fundraiser Jamie Buller MBE.

BELGIAN BRANCH

Bunkering operations

➔ The fourth and last MARS debate of the current academic year focused on carrying out safe bunkering operations with the lowest risk of accidents and disputes.

Our chairman, Walter Vervloesem FNI, opened the gathering with the welcome news that from next year the MARS debates will be open to all Belgian Branch members. He also highlighted the reduced student membership fee, at just £20 a year.

Moving to the main subject of the evening, Walter highlighted how bunkering operations can go wrong, showing a video about a bunker overflow resulting from crew relying on remote gauge readings in the engine control room rather than performing tank soundings. The gauges turned out to be faulty, resulting in a bunker overflow and a claim of US$1 million against the shipowner.

The floor was then open to Mr Kyle Richards, a Second Engineer with 10 years of seagoing experience, currently serving on Exmar gas carriers.

Properties of fuel oil

Heavy fuel oil is the residual viscous fuel remaining after distilling out the lighter more valuable components such as gasoil, kerosene, naphtha etc. Mixing new and old fuel may lead to unstable mixtures, Kyle warned, and a proper compatibility check is definitely recommended.

Pre-bunkering

A bunkering operation starts with the Master or Chief Engineer informing the owner or time charterer of the quality and quantity of fuel needed for the planned voyage (including a safety margin). The owner or charterer will then order the bunkers from their preferred supplier, and may also appoint a surveyor to monitor the bunkering operation. The survey will include a quantity survey and a quality test for each grade supplied.

The Chief Engineer uses a checklist to help in monitoring the preparation for the operation, usually based on an industry standard. Preparation includes having sufficient clean sample bottles, gaskets, scupper plugs, anti-pollution equipment (absorbent pads or pellets, brooms, shovels, drums etc.), PPE (gas detectors) and sounding rods, in addition to testing alarms, valves, etc.

Safe procedures

To carry out the bunkering operation smoothly it is important that the correct procedures are fully understood and followed. Teamwork is key to a safe and uneventful operation. Good communication between the deck and engine departments and the bunker barge or terminal is vital. Communication can be done by portable radio and/or unambiguous hand signals to avoid any misunderstandings.

When the transfer hoses, sampler and perhaps the flow meter have been connected, but before pumping begins, there needs to be a pre-bunkering meeting with the barge or terminal to agree the bunker plan for the whole operation from start to finish.

This meeting should cover volumes, temperatures, maximum pressure, start/stop signals, flow rates throughout including while topping off (slowing down when bunker tank reaches 85% of its total capacity), changeover of bunker tanks etc. In view of potential health issues the bunker supplier should provide the MSDS indicating the hydrogen sulphide content of the fuel to be delivered. The meeting must also identify the persons in charge on both sides and their respective duties and emergency procedures. The bunker plan must be read and signed by all concerned. In the event that the plan needs to be modified during the bunkering operation, everyone in charge needs to be made aware of and agree to the changes, in particular the chief engineer.

Hoses are customarily provided by the supplier. It is good practice for the ship's crew to check these for any apparent damage before connecting them to the manifold and starting the transfer.

During the bunkering a continuous manifold and deck watch should be maintained, soundings of the bunker tanks concerned should be frequently checked and temperatures/pressures monitored. If there is a change of watch during bunkering operations, a proper hand-over procedure should be followed. MLC/STCW minimum rest hours should be complied with.

Quantity issues

Except in ports where mass flow meters are compulsory (eg Singapore), standard bunker supplier's conditions usually state that the quantities established on the bunker barge/terminal are binding. The ship's crew or the appointed bunker surveyor have the right to attend and witness the soundings of the barge or shore tanks from which the fuel is supplied. The quantity received by the ship will also be established by sounding the bunker tanks prior to and upon completion of the supply.

In case of significant discrepancies, the Master should follow the instructions of the owner or charterer. This normally consists of clausing the bunker delivery note with the ship's figures and/or issuing a note of protest to the bunker barge/terminal to preserve owners'/charterers' right in case of legal dispute.

Quality issues

In addition to the quantity, it is of major importance to ensure the fuel complies with quality specifications, usually based on ISO 8217 standards. A continuous drip sampler is placed at the custody transfer point (usually the ship's manifold), and fuel is sampled throughout supply in order to obtain representative samples. At the end of the bunkering, the sampler contains sufficient product to be split over several smaller identical samples. These are distributed among the vessel and supplier. All samples are to be adequately labelled and sealed.

One of the ship's samples will be forwarded directly to a designated laboratory for testing against standard ISO parameters. It is good practice to await the outcome of analysis and the recommendations of the lab before using the fuel. Taking the inevitable delays into account, it is important for the Master to make sure there is still sufficient fuel on board from the previous bunkering to cover this period. In addition to lab testing, portable testers can provide a good indication of the main parameters of the fuel to the crew upon delivery.

One sample is retained for analysis in case of allegations that the fuel is not in compliance with MARPOL regulations, mainly in terms of its sulphur content.

Bunker spills

Kyle concluded the presentation by outlining the steps to take in case of bunker spills. Heavy fuel oil is a persistent pollutant and will be a challenge to deal with if spilled either on deck or overboard. The message is to act quickly to minimise the extent of the pollution. The recommended actions are generally:

- Stop the transfer as soon as possible (activate the emergency spill directive)
- Raise the alarm
- Deploy pollution prevention equipment (no dispersants can be used without the approval of the competent authorities)
- Take other mitigating action on board, such as trimming or heeling over the vessel, transferring the fuel to another tank
- Inform deputy person ashore (and, in the USA, the onboard qualified individual (QI))
- Inform local P&I correspondents
- Inform charterers, if any involved.

All actions should be recorded and evidence retained in view of potential future litigation.

To be properly prepared for such events realistic drills should be conducted every month, as required by SOLAS.

W Justers AFNI & W Vervloesem, FNI

Letters

JOIN THE CONVERSATION

Send your views and opinions to us at **editor@nautinst.org**, write to us at **202 Lambeth Road, London SE1 7LQ, UK** or become part of our online community:

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The reserve and use of narrow channels

➔ I read with interest the article by Captain Nick Nash *'Putting PRO into practice'* in the October 2018 issue of *Seaways*, in which he expounds on the practical application of 'route corridors', especially in narrow channels. By the nature of his paper, Captain Nash concentrates on the technical aspects of these tools.

A case recently heard before the Admiralty Court and the Court of Appeal suggests that consideration of the Collision Regulations in relation to navigation in narrow channels may also be worthy of discussion by our nautical community.

The case before the courts – *Evergreen Marine (UK) Limited v Nautical Challenge Ltd,* which can be found online at http://www.bailii.org/ew/cases/EWCA/Civ/2018/2173.html – arose out of a collision in the approaches to a narrow channel between the ships *Ever Smart* and *Alexandra 1*. The main question for the courts was whether the crossing rule or the narrow channel rule applied in the particular scenario.

In handing down its judgment, the Court of Appeal upheld that of the Admiralty judge at first instance. Following a line of established authority, it unanimously decided that it was the narrow channel rule, namely Rule 9, that governed the meeting of those two ships on that occasion. It is clear from a reading of the Appeal Court's judgment that Rule 9(a) obliges that 'A vessel *proceeding along* the course of a narrow channel or fairway shall *keep* as near to the outer limit of the channel or fairway which lies on her starboard side as is safe and practicable' (my emphasis).

Captain Nash makes reference to an earlier article, *'Sharing mental models in confined waters',* by Antonio Di Lieto and others (*Seaways*, June 2018), aimed at improving the safety of navigation in confined waters. Figure 1 in the earlier article shows a hypothetical example of own ship leaving its planned corridor within a narrow channel to avoid impeding another ship. If it is able to do so, that raises the question why it had hitherto been navigating down the middle (possibly even on the port side) of the channel, thus in a manner apparently contravening Rule 9? The term 'shall keep' – as now used in Rule 9 – has already been judicially considered in the past and interpreted as meaning that navigating in the middle of a channel and only deviating away to one's starboard side to let another vessel pass is not in accordance with the 'narrow channel rule'.

Clearly, in complying with Rule 9 the courts have recognised that ships are not expected to zigzag closely following the contours of a bank, or to place themselves in peril, and that they have to reach their berths where they need room to carry out manoeuvres.

It may be that the courts are yet to fully appreciate that, as ships become larger, the requirements of safe navigation will perhaps increasingly dictate that 'as near to the outer limit of the channel… which lies on the starboard side as is safe and practicable' may in fact, paradoxically, be the middle or even the extreme port side of it.

Where the whole or a substantial width of a channel is operationally required for a single ship, to the exclusion or modification of Rule 9, then it is submitted that (save for situations envisaged by Rule 2(b)) this can only be countenanced strictly in accordance with Rule 1(b).

Before attempting to enter such a narrow channel, it would seem to be incumbent upon those navigating the ship to positively ascertain from the port authority, VTS or pilot that the channel is indeed reserved for that ship. Insofar as they are able, they should satisfy themselves that those entities have the necessary lawful authority to declare the channel reserved. Entering otherwise, out with the strict requirements of Rule 9, is not an option. (To be clear, it is **not** being suggested that proper procedures were not followed in the real examples given. My comments above are addressed only to some of the hypothetical examples.)

In establishing and practising the new methods outlined in their articles, the authors make a valuable contribution furthering the aims of safe navigation. In applying these techniques in narrow channels we must, it is respectfully submitted, also be mindful of existing rules, which were designed with like aim.

Dariusz Gozdzik MNI

Editor's note: We invited Captain Nash to comment on the above letter. He replies:

The examples in my paper *Putting PRO into Practice* shows the mechanics of setting a route safety corridor and associated reserve. The actual positioning of same will depend, of course, on Colregs and any local rules in force for that particular passage plan. The concept is to have a defined, shared mental model that allows flexibility.

Capt Nick Nash FNI

Harbour pilot, Ports of Auckland

Anti-corruption measures

➔ Anecdotal stories of corruption and intimidating practice surface regularly, so it was heartening to learn about the significant steps taken by the Maritime Anti-Corruption Network (MACN) (*Seaways*, October 2018, p 22). The results sound impressive and are, I'm sure, welcomed by seafarers the world over.

One of the problems, presumably, is the difficulty in securing evidence when it comes to proving corrupt practice, particularly when it's just the Master/Officer and a corrupt official in conversation. So, is it feasible for ships' personnel to wear bodycams and record interactions with port officials?

Meetings could be beamed to a secure shipboard server or even, where the connectivity allows, monitored remotely in real time. This would act as a deterrent and provide third-party support (as well as evidence) should an officer or Master face intimidation.

No doubt other readers with expertise can comment on the moral, technical, legal and commercial implications of such an initiative. My own view is one of sad resignation that things have reached a stage where solutions like this might even have to be considered. But since corruption leads inexorably to higher prices, we're all stakeholders in this, so anything that might help in reducing it is worth considering.

Chris Haughton EdD FNI

Editor's note: It is important to be aware of the legality of recording devices and requirements for consent to recording in the relevant jurisdiction.

No regulation without preparation

➔ A shipping life is driven by rules, regulations and guidelines – and why not! Operating without rules to follow has resulted in many historic wrecks in our navigation charts and many grieving generations – accidents that today are almost unthinkable. This is not to say that accidents and incidents do not happen now, but the number of ships plying has increased multiple times, while accidents have not increased in proportion. Every one of these ships, be it a container ship or a passenger liner, an offshore vessel or a crew boat, is governed by a number of rules and regulations. By the time we have implemented one regulation, another one appears on the scene.

But do these regulations consider the way oceangoing vessels perform – or are they out of touch with reality?

As Master of a diving boat, I was urged to read all the regulations currently in effect in order to keep my certificates valid. I strongly feel that the weight of these regulations should be shared by owner, manager, charterer and oil major.

Ballast Water Management

This convention was first introduced as a concept in 2004, with no technology in place to enable ships to comply. By the time it came into force in 2017, the needed technology was still not in place. Ship operators must meet the burden of installing the proper equipment, which increases their operating costs. In this competitive world, some comply to survive and some give up. Does not the charterer have an obligation to share the load of the operator depending on the region in which the vessel trades?

2020 sulphur cap

This is another blow below the belt. As of 2020, the owner/operator must comply with the switch to bunker fuel with 0.5% sulphur. This regulation must be complied with – but the regulators do not have a clue where to find 0.5% bunker fuel. Is it not the charterer's obligation to order that fuel, and that of bunker suppliers, oil refineries and oil traders to supply it? Why are these regulations not branched to other parties, rather than pertaining only to ship operators/owners?

Sewage and garbage regulations

Vessels operating offshore must strictly comply with regulations on sewage discharge and garbage discharge, and are often audited on compliance. This is a noble cause – so shouldn't these regulations also be honoured by rigs, mobile drilling units, mobile production units and other offshore production and monitoring structures?

CO_2 emission

Carbon emission is another issue that baffles me. As a mariner, I fully support this cause, but I also empathise with my owners and operators.

For example, a vessel has been out of work for the past 15 days, during which time it has emitted hardly any CO_2. Upon getting a spot charter for a short job, the vessel is mobilised, working on DP and emitting a great deal of CO_2. Shouldn't responsibility for this emission be on the charterer? Why should an owner be penalised when renting their vessel to someone else?

All of this seems to be very politically driven. Oceangoing shipping and the offshore sector do not have any political weight as ours is not an industry of the politically strong countries. By contrast, oil refineries and rigs – which are directly linked to political growth and downfall – are subject to no such regulations.

Shipping transports around 92% of world's trade. These much needed regulations should not be the responsibility of ship owners and managers alone.

Capt Abhi Ranjan Banerjee AFNI

Combination ladders

➔ Captain Vallance, in the September 2018 issue of *Seaways*, has brought to our notice a variety of evolving methods of securing combination pilot ladder arrangements. He has done this in much more detail in his publication, *Pilot Ladder Manual – Advanced*. Although a short magazine article cannot include so much detail, it touched on one aspect that does need further discussion.

Capt Vallance notes that the British Chamber of Shipping states: 'Practically we cannot see how this can be safely achieved', with reference to securing combination arrangements at a variety of draughts beyond 9m freeboard. It is patently obvious to any practical mariner that the lower end of the accommodation ladder describes an arc centred on the hinge at the top end. Thus for every different freeboard the lower end must have a different securing point. Also, the horizontal suspension point for the pilot ladder side ropes must be moved forward or aft on the main deck to suit the required vertical disposition. This evolution is a result of the rapidly increasing number and size of larger ships.

The designers of such arrangements have developed an obvious response which includes the suspension of a short length of ladder beneath an opened trapdoor in the lower platform of an accommodation ladder. The pilot team in my port have experienced an increasing number of such arrangements. Although designed, constructed and certified for use by reputable organisations, they are in no way compliant with SOLAS Chapter V Regulation 23, IMO Resolution A.1045(27) Annex or New Zealand Maritime Rule Part 53 – Pilot Transfer Arrangements:

- Manropes and ladder side ropes are not secured 1.5 metres above the lower platform
- Ladders do not extend 2 metres above the lower platform
- Inboard frame of trapdoor requires pilot to lean out and back while transitioning to and from the accommodation ladder.

On one recent and notable occasion, when scheduled to board an older ship that was new to this trade, I found that the lower platform trapdoor opened inwards and the underside included two steel hand-holds to 'assist' that transition. The result was that I flew to the previous port and joined the ship from the dockside.

I spent a very hospitable coastal voyage, with the captain, the over-carried pilot from the other port and myself deeply engrossed in the international regulations and local laws while deciphering an almost continuous stream of 'we fail to understand' emails from interested parties ashore. The captain was most amenable and willing to assist in any way possible to achieve a temporary alternative boarding arrangement 'insofar as is reasonable and practicable', including shipboard modification by cutting and welding. This will serve until the ship returns to its home port and can achieve a permanent solution, before its next arrival in Australia or New Zealand.

Nigel Meek AFNI

Refugee crisis

➔ During 2016–2017 I worked on board the civilian rescue ship *Aquarius* as SAR Coordinator for SOS Mediterranée, operating in partnership with Médecins Sans Frontièrs. To date, *Aquarius* has rescued more than 30,000 people from unseaworthy boats, sometimes pulling survivors out of the water in the very last minute and under dramatic circumstances.

From my first mission in spring 2016 to the end of my last engagement in summer 2017, the *Aquarius* was warmly welcomed by the Italian authorities, particularly by the Italian MRCC. Co-operation with all other (inter)governmental stakeholders was constructive and the need for civilian rescue assets provided by NGOs was well recognised. SOS Mediterranée enjoyed public respect and was awarded the UNESCO Peace Prize and other renowned awards on European and national levels.

Now, the political temper has changed dramatically, not just in Italy but all over Europe. NGOs have been under spurious allegations of contributing to the migration crisis in the Central Mediterranean or even colluding with human smugglers. European politicians declare themselves not responsible for providing safe disembarkation ports. At the same time they have successfully barred NGOs from continuing their rescue missions.

These developments have culminated in Panama's withdrawal of flag from *Aquarius*, under blatant political pressure. *Aquarius* was the last rescue ship operating in the Central Mediterranean. It has been shown that mortality on this route has risen since civilian SAR assets have been blocked, despite significantly lower arrival figures. Now that *Aquarius* has lost its registration, mortality will rise yet further – but will go unnoticed.

The political debate of migration and asylum is not a matter for The Nautical Institute.

However, the longstanding obligation for seafarers to rescue survivors 'with no differentiation between refugees, economic migrants, victims of people smuggling or survivors of accidents at sea' is recognised by all maritime stakeholders. Not only are the legal issues of concern to seafarers, the humanitarian crisis – or perhaps better to say: the crisis of humanity – cannot leave us seafarers unaffected.

The removal of civilian rescue ships increases the burden on the merchant fleet sailing in this area. If there is no prospect of a safe port being assigned for rescued persons on board in accordance with international maritime law, Masters and crews might face dire and unbearable conditions if confronted with SAR situations – to say nothing of the persons in distress.

This is affecting the whole industry. If European leaders fail to find a humane and sustainable solution for enabling SAR operations, disembarkation and resettlement in accordance with international law (such as the one outlined in the joint proposal by IOM and UNHCR), seafarers will be caught in limbo – and even tempted to ignore their moral and legal obligations.

The situation is too serious to keep silence.

Capt Mathias Menge MNI
Föhr, Germany

The Nautical Institute LinkedIn forum

JOIN THE CONVERSATION

The Nautical Institute has a lively discussion group on LinkedIn
http://www.linkedin.com/groups/Nautical-Institute-1107227

THIS MONTH WE LOOK AT: EEDI VERSUS MINIMUM POWER PROPULSION

Ghulam Hussain FNI wrote: A shaft power limitation is being discussed at the IMO, in order to resolve potential conflicts between EEDI requirements and minimum required propulsion power. However, ships must retain sufficient propulsion power to ensure safe manoeuvring in adverse weather conditions. A final report by an IMO Correspondence Group is expected to be presented at MEPC 74 in mid-2019.

There are serious proposals and lobbying that shaft power sufficient to counter Beaufort Force Seven (7) should be sufficient. Do you agree that 'adverse sea conditions' can be restricted to Beaufort Force Seven (or even Eight)?

THE INSTITUTE'S LINKEDIN COMMUNITY RESPONDED:

➔ As marine pilots, we are already experiencing dangerous situations where the shaft power promised by the ship's Captain cannot be provided due to load program restrictions, running on marine gas oil etc. Additionally, newer ships are being built with smaller, less powerful yet more economical engines in comparison with their displacements and size. Obviously, maximum shaft power during adverse sea conditions must be available in the interest of safety. There are other situations as well, such as when performing difficult docking operations, that can require more shaft power or "kicks" to perform safely. Also, when operating in ice conditions maximum shaft power is required. Ideally, there should be no limitations.

➔ No. The marine industry in general is suffering from 'good enough' syndrome. Manufacturers, builders, classification societies, operators, managers, charterers and trainers all approach safety from the perspective of 'Is it good enough?' They continue to reduce safety margins to the bare minimum. The concluding assessment is usually qualitative and does not stand up to analytical scrutiny. Climate change is real. The proponents of the idea of limiting shaft horsepower to manage only up to Force 7 ought to sail in the Gulf of Alaska in the winter to experience the effect of weather. Ships are barely able to maintain steerage way in the headwinds and swell. Engine load goes to max even when running half ahead.

➔ I can only disagree with the idea that shaft power enough to counter Force 7 should be sufficient. At a time when warnings about climate change and consequent stronger storms are constant, the idea seems bad. I was trying hard to keep this comment short, polite and diplomatic. Believe me, it was difficult. Now, I am closing the comment and will go and hit the punching ball…

➔ I am surprised at such a slow response from seagoing members to such a serious question. Such lobbying to arbitrarily keep ships' SHP to a level required to counter a near gale beggars belief. Who are these people? Have they ever experienced the effort and skill required to drive a ship through heavy weather for days on end? I doubt it. By all means build maritime autonomous surface ships with weak engines: only the environment will suffer should they sink. When they do sink will that be worth the pollution otherwise caused by a little bit of extra power? Come on guys, keep this ball rolling and complain about this 'coffin ship' idea. Surely, to any seafarer who has experienced severe weather, a limitation in shaft power is outrageous.

➔ I could not possibly object strongly enough to a proposal to limit shaft power to that sufficient to manoeuvre in Beaufort 7–8. This would simply shift pollution from air to water, as countless ships would go aground, resulting in countless oil spills. There are regions and seasons where Beaufort 7–8 is a regular and normal occurrence.

➔ Working to a Force 7 would in my view hardly constitute heavy weather. A modern ship should be able to retain seakeeping control in all expected meteorological conditions with a percentage power capability in reserve. Winds of 80–100 knots are not unheard of in many parts of the world and a ship may find herself in an unavoidable situation of having to cope with such circumstances.

There is also a minimum power issue with regard to pilotage manoeuvring in severe weather and strong adverse tidal current conditions. This should not be overlooked in determining such criteria.

➔ Force 7 is just starting to be potential trouble, nasty weather. I have experienced 9, 10, 11… on a VLCC and destroyer. Better to have extra power, and slow down if she starts to vibrate and suffer. Of course, that feeling for a dangerous situation is one the Master / Commanding Officer must develop during the course of their career. Good seamanship is both art and knowledge! Mentoring is important in that area.

This report attempts to give a representative summary of the discussion – it is not possible to include all comments. To see the discussion in full, please visit LinkedIn.

Representing The Nautical Institute to the maritime industry and beyond

Merchant Navy Medal

Congratulations to all members of the The Nautical Insitute who received this year's Merchant Navy Medal, which was presented by HRH Princess Anne at a ceremony in Trinity House, London.

New HQ staff

Welcome to Caitlin Kelly and Magdalena Kolodziej, who join the publications and membership team at The Nautical Institute. Caitlin is our new editorial assistant, while Magdalena will be providing support for our Branch network.

HQ staff out and about

Capt Ghulam Hussain, The Nautical Institute's permanent representative at the IMO, attended the subcommittees on Carriage of Cargoes and Containers (CCS5) and the Implementation of IMO Instruments (III5).

Capt Maneesh Varma met with the Institute of Marine Surveyors to exchange notes. With other NI staff members, he also attended the International Maritime Day celebrations at IMO HQ, and the Intermanager conference on ship management and operations.

Calling Iberia Branch members

The Nautical Institute is reviving its Iberia Branch, and we hope to start holding meetings soon. Branch secretary Mark Bull is trying to contact as many members as possible, but he has found that many email addresses are out of date.

To check that The Nautical Institute has the correct details for you, please log in to the secure members' area on the Institute's website. You will be able to see the information that we hold, including your email address, and you can update it if necessary!

The Iberia Branch is also launching a dedicated LinkedIn page. You can find it at https://www.linkedin.com/groups/13574684/

We look forward to hearing from you soon.

President on the move

L to R: Mr Joseph Bugeja, Chairman & CEO of Transport Malta, Dr Ian Borg LL D, Hon Minister for Transport, Infrastructure & Capital Projects, Capt Nick Nash FNI and Capt Reuben Lanfranco FNI at Malta Maritime.

Capt Nick Nash FNI has visited several training establishments to promote membership of The Nautical Institute. He is seen here with Capt Panagiotis N Tsakos and Mr Nikolas P Tsakos and recent graduates from Maria's Home Education and Culture Campus in Chios, Greece and taking the opportunity to test one of the ship models in Warsash, UK.

New members

The Nominations Committee has nominated the following for election by Council:

Associate Fellow

Ariful Islam, S Cdre/Director General (Bangladesh (Dhaka))
Brown, R J Captain/Master (US East Coast (N))
Chauhan, S Captain/Head Of Commercial (Bahrain)
Churin, M Captain/Dean of Navigation (Russia)
Darif, O Captain/Vetting SuperintendentU.S. Gulf ((Houston))
Gautam, S Captain/Superintendent (India (North))
Gesilva, J J Captain/General Manager (Philippines)
Hanlon, M J Captain/Marine Pilot (UK/SE England)
Karlsson, N P Mr/Director, Head of Marine Standards & Operations (Denmark)
Khanna, P Captain/DPA (UAE)
Lamba, M Captain/Master (India (North))
McGuire, R Captain/Rig Operations Consultant (UAE)
McMichael-Phillips, S J Captain/Head of Partnering & Engagement (Singapore)
Quddus, H Captain/President & CEO (U.S. Gulf (Houston))
Ruiz De Larranmend, A Mr/Master (Spain)
Tuero Sala, R Captain/Master (Spain)
Vanderkerken, S H L Captain/Master (Belgium)
Vinnytskyi, A Captain/Vice General DirectorUkraine)

Upgrade To Associate Fellow

Afzal, I Captain/Consultant (UK/Central Scotland)
Duggal, B Captain/Associate Director (U.S. Gulf (Houston))
Fedorenko, O Mr/Consultant (Ukraine)
McLaughlin, R Lt Cdr/Retired (UK/NE England)

Member

Aldemira Conde, R Captain/Master (Spain)
Bamidele, J K O Mr/Chief Officer (Ghana)
Beardall, M Mr/Captain (Antigua)
Buller, G D D Mr/Chief Officer (UK/SW England)
Burmaka, O Mr/Associate Professor (Ukraine)
Cleland, R Mr/Efficient Deck Hand (UK/Bristol Channel)
Colandrea, G Mr/Fleet Safety Manager (Australia - NSW)
Collins, R Lt/Marine Technical Advisor (Trinidad & Tobago)
da Silva, L G C H Mr/Port Projects Consultant (Brazil)
Dillenseger, A J Mr/Deck Officer (Australia - QLD)
Dobson, R Mr/Assistant Harbour Master (UK/Central Scotland)
Dykes, R C Mr/Third Officer (U.S. Gulf (Florida))
Ellis, S Mr/Captain (U.S. East Coast (N))
Firdaus, M S Mr/2nd Officer (Indonesia)
Gnatenko, V Mr./Director (Ukraine)
Hettiarachchi, H I D Mr./Lieutenant (Sri Lanka)
Homer, A P Mr/OOW (UK/N Scotland)
Jahnke, K R Mr/2nd Mate/DPO (U.S. Gulf (Florida))
Karthikeyan, S Captain/Master (India (South))
Kothalawala, H V Mr./Sub Lieutenant (Sri Lanka)
Langbecker, D Mr/Deck Officer (Australia - QLD)
Lavelle, D A Mr/Third Officer (Ireland)
Lever, C I Mr/Master (Australia - QLD)
Lucero Ferreira, J G Mr/Master (Mexico)
Lutsenko, D Mr/Chief Mate (Ukraine)
Madhuranga, K Mr./2nd Mate (Sri Lanka)
Martin, A J Mr/1st Officer (New Zealand)
Milewski, P Mr/Chief Mate/SDPO (Poland)
Mneimneh, K Mr/Safety Officer (UK/Central Scotland)
Pearson, S B Mr/Asst. Professor (U.S. Pacific Coast (C))
Peiris, A I Mr/Chief Officer (Sri Lanka)
Petria, A Mr/Senior DPO (Romania)
Phromlard, K Mr/DPO (Thailand)
Rajakaruna, A P P Mr./3rd Officer (Sri Lanka)
Rehman, H U Mr/2nd Officer (Pakistan)
Ryzhkov, O Captain/Master (Ukraine)
Sannikov, O Captain/Master/SDPO (Ukraine)
Scott, S T Mr/2nd Officer (Australia - QLD)
Sodhi, J S Captain/Superintendent (Brazil)
Spriggs, P Ms/DPO (U.S. East Coast (N))
Stringfellow, S G Mr/2nd Mate (UK/NW England & N Wales)
Taylor, T J Captain/CEO (U.S. Gulf (Florida))
de Vasconcelos Sena, C A Mr/Captain (Brazil)
Velberg, N A Mr/Master (Indonesia)
Westcott, M Mr/Safey & Compliance Manager (UK/Solent)
Yap, F Q Mr/Chief Officer/JDPO (Singapore)
Zou, H Captain/Superintendent (China: Hong Kong SAR)

Upgrade To Member

Edwards, C A J Mr/OOW (UK/London)
McCarthy, L Mr/Deck Officer (UK/NE England)

Associate Member

Stiles, S Ms/Senior Secretary/IMO (UK/London)
Swann, A J L Mr/Deck Officer Cadet (UK/Solent)
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