THE INTERNATIONAL PILOT

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THE JOURNAL OF THE INTERNATIONAL MARITIME PILOTS' ASSOCIATION

IN THIS ISSUE:

A MESSAGE FROM THE PRESIDENT

Fellow Pilots,

The ancient Greeks created the myth of Sisyphus – who everyday for eternity had to roll an immense boulder up a hill only for it to roll down when he neared the top – perhaps to illustrate how laborious life can be.

I sometimes feel that our collective effort in engaging decision-makers in our respective jurisdictions shares similarities with Old Sisyphus' days. Nowhere is this more evident perhaps than in respect of questions related to the need for pilots to be insulated from undue commercial pressure, so as to be able to systematically focus on safety first.

When one reviews how pilotage systems are structured internationally, it rapidly becomes evident that the vast majority of jurisdictions have concluded that the public interest, and marine safety, are best served through pilotage services being provided, on an exclusive basis, by a single group of pilots in any given compulsory area – pilots who can truly exercise their best professional judgement in a context where they are free from commercial pressure.

Although the value of this model is demonstrated literally every day around the world with pilots safely conducting vessels in challenging, high-risk waters, it never ceases to amaze me how this most basic principle remains under siege.

For example, one recent situation that is cause for concern has to do with a study conducted by the Organization for Economic Cooperation and Development, the OECD. In a so-called Competition Assessment Review of Portugal's maritime transportation sector, carried out in collaboration with the Portuguese Competition Authority, the OECD suggests that some aspects of the pilotage service are not efficient enough and, in response, it recommends de-regulating these matters including the issuance of pilotage exemption certificates.

One of the problems with the OECD study is its failure to appreciate that, like most highly-complex systems, the component parts of any pilotage system are inter-dependent. Changes to one component will necessarily impact other aspects of the system. The OECD Report, for example, shows no overarching regard for how recommendations will impact the performance of the system as a whole.

Continued over on page 3.

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Message from the Secretary General

Dear Colleagues,

A few months ago I heard a comment, not from a member, that IMPA was ''only involved in ladders''. That came as a shock to me, sitting at IMO trying to make sense of how scrubber technology could remove toxicity from Exhaust fumes and clean the same toxins in seawater without environmental damage!

However it made me think deeply about what we do and the perception of our work. Ladder Safety is possibly our most visible concern – its relatively high profile, photogenic and human focussed. However it takes its place amongst a lot of other work, like this week (22 – 26 October) being at IMO MEPC 73, principally to sit in on the debate about fuel, especially after 1.1.2020 when low-sulphur will become the norm.

Next week IMPA is again at IMO for HGDM (IMPA has contributed text on possible future digital communications involving Pilots as part of the E-Nav project). This is not ''sexy'' work and doesn't make for an interesting story. Likewise at the end of HGDM, there are efforts by OCIMF (Oil Companies International Marine Forum) to spark a debate on MPX. IMPA don't necessarily see this issue as pressing, and strangely, neither do the shipowners. This is another ''dry'' area of IMPA's work which is going on quietly and without fanfare.

IMPA is also focussed on the ''Scoping exercise'' underway at IMO in respect of Autonomous vessels. Our concern is not whether or not this comes to pass, but the potential interaction between autonomous vessel and manned vessels under Pilotage. We also see an emerging trend (starting in Scandinavia) to dilute / dispense with Pilotage as an enabler to the introduction of Autonomous Vessels.

All of this takes a great deal more time than the effort we put into Ladders, but is understandably not so visible.

The Office staff send you greetings at this Festive period, when many of you will work on regardless of the time of year. Please be safe.

Nick Cutmore

Continued from front cover.

This example illustrates a challenge that pilots face in many jurisdictions. Decision-makers with a background that sometimes has more to do with economic theory than the operational reality of conducting vessels, tend to view with suspicion systems – like regulated pilotage – that are insulated from market forces. For them, such a situation is bound to be inefficient in that they believe the same service could be offered at a lesser cost, if competitive pressures were allowed.

What they do not immediately realize, however, is that it is not the same service that would be offered if competitive pressures were allowed! It is a service that would actually compromise safe navigation!

Another striking example is the report recently released by the U.K. Maritime Accident Investigation Branch into the CMA CGM Centaurus' heavy contact with quay and shore cranes while arriving at the port of Jebel Ali under pilotage. Critics of pilotage will be prompt to use the report's suggestion that the accident was caused by a lack of bridge resource management training.

What they may be less prompt to acknowledge, however, is that the pilot was operating in a system in which safety might not be, at all times, the first priority – as evidenced by the report's finding that « monitoring the time taken to conduct safety critical acts such as the pilotage, and linking the attainment of time targets with bonus payments can lead individuals into prioritizing performance and reward over safety ».

That the report did not, however, formally identify this factor as a contributing cause to the accident raises questions.

What it also does, is remind us that there may be only one sure antidote to operating in a system that does not truly place safety above competitive considerations: pilots tirelessly engaging decision-makers to make sure the essential principle of maintaining independence from commercial pressure is well understood!

Maybe one can imagine Sisyphus happy. Maybe the everlasting struggle itself towards the heights should be enough to fill a man's heart!

Simon Pelletier

Roundtable of Ports Organisations

At a recent meeting in London at the Baltic Exchange, heads of the world's leading associations for the world port community met to establish a Roundtable with view to establishing a stronger, unified voice of the port sector in the maritime industry as a whole.

At a recent meeting in London at the Baltic Exchange, heads of the world's leading associations for the world port community met to establish a Roundtable with view to establishing a stronger, unified voice of the port sector in the maritime industry as a whole.

Each association drew up its main priorities moving ahead with all parties agreeing to collaborate closely on existing and new projects and programmes, particularly those associated with meeting IMO regulations on safety, environment and operations.

Roundtable programmes and projects already in action

During the discussion, follow up actions were planned on several projects and programmes in which several Roundtable member organisations are already involved together:

Maritime Anti-Corruption Network (MACN):FONASBA, ICHCA, IAPH, IMPA, ISSA – www.maritime-acn.org

Navigating a Changing Climate: IAPH, IMPA – http://navclimate.pianc.org

Taskforce Port Call Optimisation: IHMA, IAPH – www.portcalloptimization.org

World Ports Sustainability Program: IAPH, ICHCA – https://sustainableworldports.org

Other priorities discussed included the adoption of "single window" data information exchange between all port players as well as the impact of autonomous vessels on safety. The group also looked at other key port industry hot topics including container weighing standard processes, ISPS adoption, e-maritime and ship reporting, electronic FAL documentation use, CTU packing codes, safe mooring procedures and maritime signage.

The newly appointed Secretary General of ICS, Guy Platten, was also invited to join the meeting to discuss how the ports and shipping sectors could work closer together to achieve common objectives.

Exploratory talks included the adoption of an inclusive 'supply chain approach' towards greenhouse gas emission reductions, bunkering solutions to tackle the IMO 0.5% global sulphur cap on fuel by 2020 and the optimization of port calls to the benefit of all parties.

IAPH's managing Director Patrick Verhoeven, who is also principle coordinator of its World Ports Sustainability Program, expressed his thanks to all participants and stated:

"This first Roundtable meeting of international port organisations sets the ball rolling in terms of sharing information and resources between key players in the port community, and providing a united voice in global fora such as the various working committees of the IMO. This follows the first ever Ports-specific meeting earlier this year at the IMO headquarters in London which aimed at bringing shipping and port interests closer together"

ICS Secretary general Guy Platten commented:

"It is in the mutual interests of shipping and ports to cooperate more closely. The future availability and quality of onshore power facilities as well as quality low-sulphur fuel and LNG bunkering infrastructure in ports will be of vital importance to owner-operators. Optimising ports calls through better use of data, standardisation of procedures and digitalisation will also create a win-win situation for shipping and ports."

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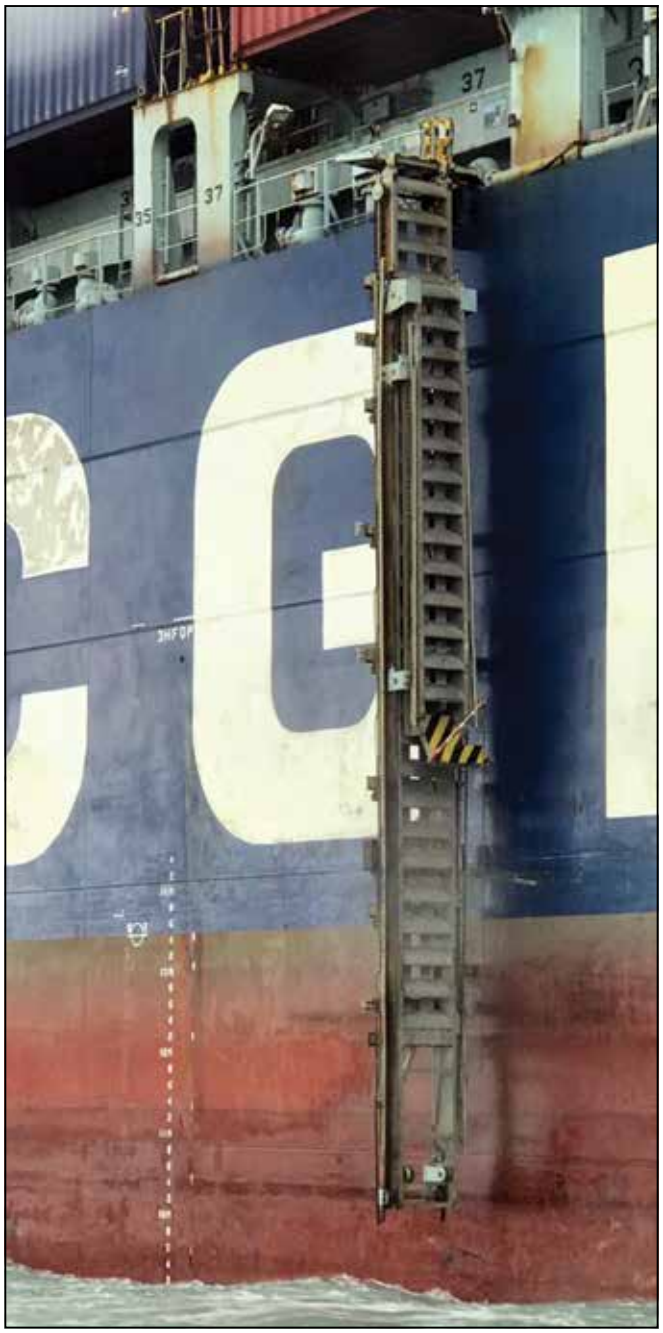
Follow us on:

The accommodation ladder of the gangway of the CMA-CGM "Chateau Dif", hangs vertically after the gangway wire parted upon departure from Miami on May 15, 2018.

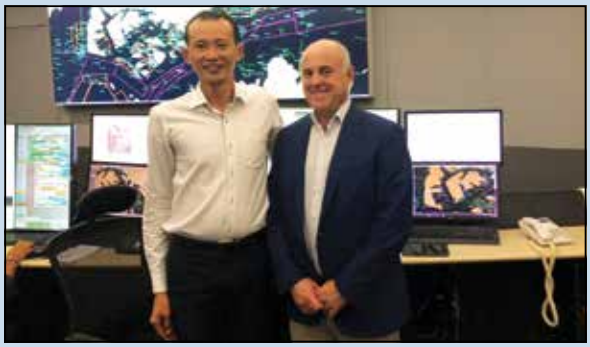
This near miss could have resulted in the deaths of two Pilots from the Biscayne Bay Pilots Association. Suddenly and violently without warning the portside accommodation ladder collapsed from its stowed position of about 20 degrees from horizontal. In a split second it was dangling vertically. The wire that raises and lowers the ladder simply parted.

The Captain made a quick decision to depart and deal with it after the Pilot had disembarked so the Pilots debarked from the starboard accommodation ladder/pilot ladder without incident, once they had completed their manoeuvres.



IMPA President meets Singapore Pilots

Simon Pelletier in the Pilot Despatch Centre of Singapore with Jimmy Koh, Chairman of PSA Marine and an active Pilot in the Port.



Keeping watch at IMO

Some background on IMPA's work at IMO.

HGDM (Harmonisation Group on Data Modelling) this group is a follow-on from the outputs of the IMO E-Navigation project and is covered by Jean Daniel Gilles (Fr) and Simon Pelletier. It is focussed on so-called "Maritime Service Portfolios" (MSP). MSP 6 is Pilotage and IMPA is the sole body recognized for its development.

MASS (Marine Autonomous Surface Ship) this project has enormous momentum (see message from President on PI) and whilst IMPA notes the absence of any enthusiasm whatever from the Shipowners to order such vessels, our concern is on the subset agenda of investigating regulatory impediments to introducing such technology which will impact on Pilotage regulation either at IMO or nationally.

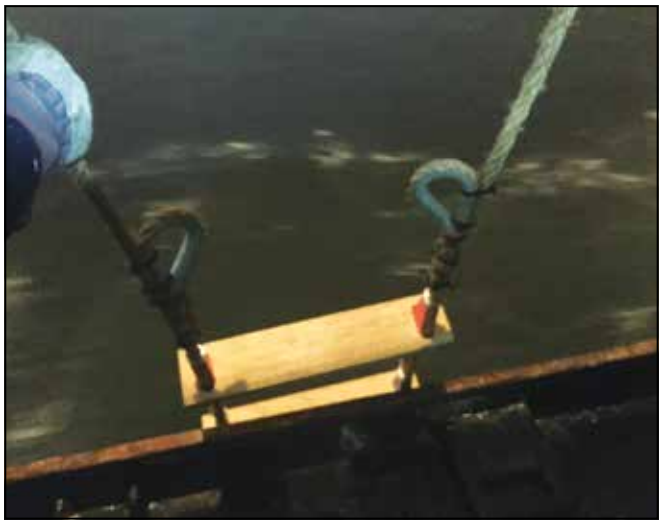
This latter point and not the technology is what IMPA is focussed upon.

Recommendations on BRM Courses for Maritime Pilot

IMPA published the above in June. It can be found on the General Access area of the IMPA website under "IMPA Policies". Hard copies can be provided by the office. A French language version is being prepared to go on the website.

Contract out on IMPA President?

These "cable ties" greeted IMPA President Simon Pelletier on the HAL "Rotterdam" during its recent Quebec call, ironically in the middle of IMPA 's 2018 Safety Campaign. The Captain was given some advice to assist him comply with his SOLAS obligations.



Port of Sete: An electric pilot boat project

The project, launched two years ago, is now in its final stage. The pilot station in Sète will soon see one of its launches transformed.

The conventional propulsion will be replaced by an electric engine. It is the company MGH who developped the technology and supervised the retrofitting.

The name of the project is "Green Pilot" and has gathered together - along with the start-up MGH - the region of Occitania, Port Sud de France (the managing body of the port of Sète), and the pilot stations of Sète and Marseilles-Fos.

Also venturing in partnership are "Electric Motion" and the design office "Mauric". The project was recently awarded a prize at the 8th "Assises des ports du futur".

This pilot boat is the Maguelonne, originally a 12 meters spare launch built in 1980.

She will be equipped with an electric motor and a pack of batteries in order to carry out her missions.

The work must begin at the end of the year and may be carried out on the industrial site ot the Pilot Station of Marseilles-Fos.

A return into service is planned for next year. The boat will have become a real prototype and will be tested over several months by Sète crews.

MGH, a start-up with an interest in marine energies and electric solutions for the maritime sector, wishes to develop a new market, that of the electrification of small units.

The port and the region, for their part, want to create a movement around electric energy, thus improving the environmental impact of the marine activities in Sète.

This propulsion has in fact the advantage of considerably reducing the noise and eliminating exhaust gas. For the Hérault port, adjacent to the city centre, this has become a necessity.

The first aim of Green Pilot will be to demonstrate the feasibility of an electric boat of a small size.

The pilot boat must be resistant, reliable, powerful and fast. Her implementation must not be disadvantageous.

For electric recharge, the Maguelonne will have access to a shore power supply post, the construction of which will be assured by the Port of Sète.

An installation of nearly 100.000 euros cost, the exact site of which has not yet been determined.

Two options are considered: the pilot station or quai du Maroc. The available power will be 100kW and shall allow a full charge within 2 hours.

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Get to Know your Executives

Yeong-Sig Choi IMPA Vice President since 2018

What is your role at IMPA and what does it entail -
I have been a member of Safety Sub-Committee and Technical Committee since 2014 as one of advisors. All vice presidents have their own regional coverage. I stand for Asia & Australia region.

What is the best part of your job? -
What I think the best of my job is having chance of meeting other people and culture around the world. Every country has different food and different piloting system as well. We are able to learn something from understanding each other.

What happens during an average day at work as a pilot? -
In my port, Incheon, various vessels are calling in size and cargo, 2,000 GRT coastal carrier to 160,000 GRT LNG and VLCC. 42 pilots are divided by two teams. One team works for a week and another in a rest or stand by. Switching team is made on 1400hrs Monday. I have to make myself ready for piloting job with 15 minutes advance call by my staff.

What are you most proud of? -
My family. I have one daughter and one son with only one(?) beautiful wife.

Tell us three things we wouldn't ordinarily know about you? -
I like golfing, mountain climbing and travelling around the world.

What's your guilty pleasure? -
Watching golf tournament in sofa with sipping wine.

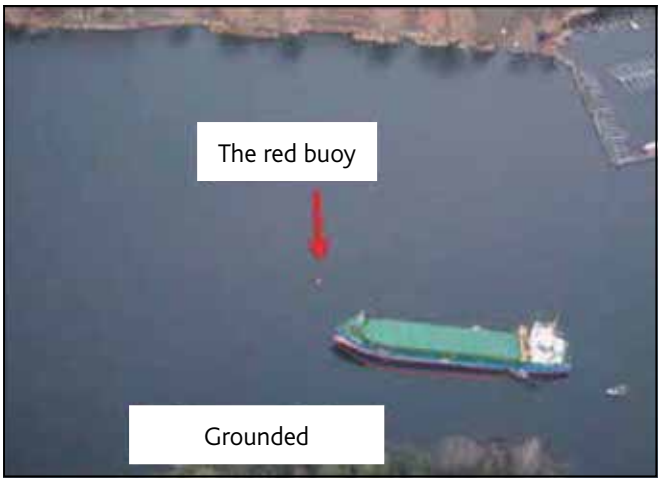
IMPA welcome a new member

Captain Michio Nakayama in as the new IMPA Advisor from Japan. He is part of Professional Standards & Qualification Sub-Committee, Safety Sub-Committee, Asia & Australasia – Regional Advisory Committee.

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.

Original source and NI MARS.

NZ Maritime Pilots Association – 2018 Conference

The pressure's on – a lack of understanding of operational issues

"Why have you slowed down? The delay is unacceptable. We need the ship alongside Monday morning without fail. There will be severe consequences for you should the voyage be delayed further."

Friendly people, those charterers, who are never off the master's back as they endlessly attempt to micro-manage the voyage. Sure, the cargo is important to them and their clients, but the trouble is that they are treating a ship at sea as would an angry consignee after their vanload of goods has got lost on the motorway.

It's a ship, for goodness sake, and the reason the master has slowed down is because he is battling a storm at sea that is barely enabling his vessel to make headway. Don't these people understand ordinary operational limitations, or the demands of safety?

The answer is, quite simply, that they don't, as the people who are sending these increasingly angry messages are probably landsmen, who really do think that a 15 knot ship ought to progress 360 miles per day and they are entitled to rage and bully when these expectations are not fulfilled. They think that their pressurising of the master of a ship they have chartered is fully justified, facilitated by the wonderful communications that enable them to exercise their power and authority 24/7.

Nothing new about commerical pressure

There is nothing new about commercial pressure on people operating ships. A century ago the master of a storm-battered ship would "note protest" on arrival to ward off the accusations that he hadn't been prosecuting the voyage with the zeal that was expected of him, on account of the weather or some other extraneous force outside his control.

There were (and still are) hard-driving operators who will use the fast passage of Captain A to shame the slower progress and obvious caution of Captain B. There have always been people – terminal operators – dispatchers – port captains acting for the charterer – who have tried to make the master of a ship do something he would rather not have done.

The difference these days is that not only do we have people with no real experience of ship operation exerting the pressure, but that they now believe that their wonderful communications and apparent knowledge of the ship's position give them the authority to superimpose their will on the master of a ship. And all too often, owners will defer to them and fail to support their master, thus encouraging their behaviour.

Unsafe practice

So it is good to see that the Nautical Institute is taking up the cudgels on behalf of hard-pressed shipmasters who find themselves being urged into unsafe practice by their charterers. In a hard-hitting feature in the NI's Seaways journal , ship's officer Vashchenko Leonid expressly states that this lack of understanding about operational issues "is putting safety at risk". He cites a number of instances where the judgement of the master was over-ridden by individuals acting for the charterers, such as refusing to permit a pilot to be carried in the Danish Sounds, abusive telephone calls to a ship in a storm, and demands in voyage instructions demanding that a ship proceed to a berth for which she was far too large. These "amateur attempts" to interfere in matters affecting operational safety, it is suggested, may be a consequence of a weak freight market, but are putting ships and those aboard at risk.

Bullying, lack of respect, lack of awareness, threats of demotion or dismissal, abuse of communications and doubts being cast on the professional judgement of the people "on the spot" have reached such a level that action needs to be taken. Captain Leonid suggests that there is a need for an international resolution or convention to govern the interaction between ship and shore.

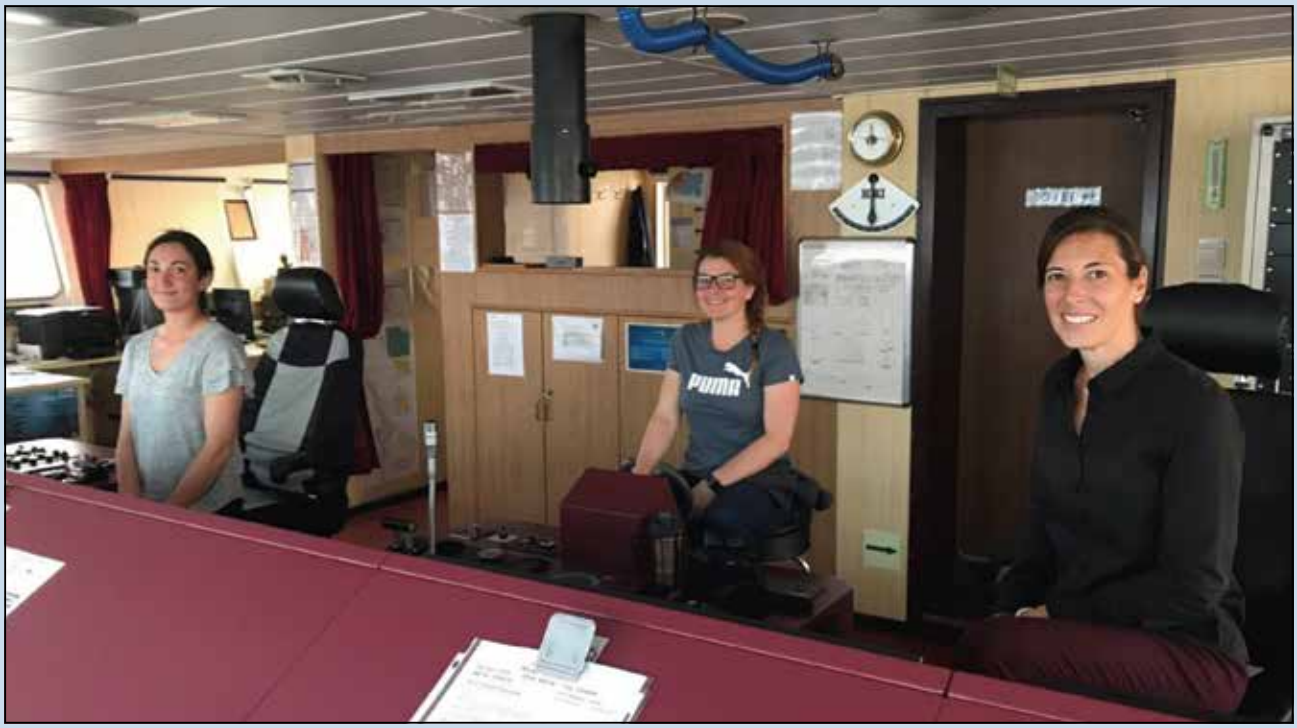
Responding to everyday challenges

Seafarers, he says, "remain the only people who can effectively respond to the everyday challenges they face". I'm not sure that an official document can improve what is fundamentally a matter of manners. Naming and shaming organisations which condone such behaviour, might be a better policy.

People ashore need to remember that ships do not run on tracks, like trams. They perhaps also need reminding that the sea can be violent and unpredictable. Earlier this month there was a poignant reminder on the Hapag-Lloyd website honouring the memory of the 28 people who died, 40 years earlier, in their big barge carrier Munchen, when the ship was overwhelmed by a violent storm off the Azores. This was a large, beautifully maintained vessel, operated by a crack German liner company, but she was overwhelmed nonetheless; just one of the sad reminders of the power of nature, that modern day charterers and shore-side managers should remember.

Posted 11 December 2018.

St Lawrence Pilot Amelie Tessier (right, in the picture) met this all female Bridge Team in August when she conducted their vessel on the river.



How a large ship could be unsafe - Manuel Casaca

We are all aware that the pilot's task is not always an easy one. In addition to our technical and local knowledge, fast reaction capacity, positive outlook and so on, every day we encounter the authority of the ship's captain and his competence/incompetence. In fact, Appendix II of the IMO Recommendation A.960, "Recommendations on Training and Certification and on Operational Procedures for Maritime Pilots other than Deep-sea Pilots", attempts to harmonize the pilot's relationship with the captain. Particularly in chapter 5, with regard to the exchange of information between the captain and pilot: "... the discussion of any special conditions such as weather, depth of water, tidal currents and marine traffic that may be expected during the passage, and any unusual ship-handling characteristics, machinery difficulties, navigational equipment problems or crew limitations that could affect the operation, handling or safe maneuvering of the ship". However, sometimes the pilot needs extra information that is almost never available, namely with regard to the ship's stability. If this information is not visible on the bridge, we should be provided with it, depending on the mission to be achieved. On reliving personal and especially adverse experiences, I decided to compile this type of information in the hope that it could be useful.

The current status

Over the past ten years, in order to improve the economy of scale there has been a growing appetite for even larger container ships, in order to increase the cargo transported. In the May 2017 issue of the magazine Containerisation International on the subject of container ships that have a capacity of 16,000TEUs or more, in April 66 ships were found operating, 21 were commissioned for 2017, and 34 for 2018 onwards. These figures include MOL Triumph delivered by Samsung Heavy Industries Co., Ltd. to Tokyo-Mitsui O.S.K. Lines, Ltd (MOL), on March 27, 2017, with the following measurements: length 400m, breadth 58.8m, molded depth 32.8m, draft 15.5m and capacity for 20,170TEUs. Also in March, the Maersk Line received from South Korean Daewoo Shipbuilding & Marine Engineering (DSME), the Madrid Maersk, a container ship with a capacity of 20,568TEUs, 196,000TB, 400m in length, 58.6m in breadth and 12.5m maximum draft.1 However, in February 2016 two megaships ran aground, which raised major safety concerns. Lloyd's List Intelligence Casualty Statistics presented a drastic number of losses per ship, as shown in the table in figure 1 (intentionally omitting some types of ships).

According to the European Maritime Safety Agency (Emsa), 12% of the maritime accidents and incidents between 2011 and 2015 were fatal and occurred when the ship capsized or listed. This means we pilots do not want to be included in such news.

Some reasons for accidents

Although the accidents involved every kind of ship, in this article we considered primarily the case of the megaships. The fact is that, sometimes when the pilot reaches the bridge, there is too little time to exchange information due to bad weather or the fact that the ship is already in restricted waters. Therefore, the pilot might not be informed about the ship's stability or any major problem that could have been forgotten or omitted.

It is not difficult to see if the ship's GM (metacentric height) is large or small. The rolling period is an excellent source of information. Nevertheless, how small can we consider the GM? The metacentric height figure gives us accurate information of the ship's stability, but only for small sloping angles. For slopes of more than 10 0 we use the GZ righting lever to check the ship's stability. The initial stability guideline stated in the IMO resolution MSC.267(5) (Code IS 2008) is to be adopted. Among other guidelines this resolution states that "the initial metacentric height GM shall not be less than 0.15m" and that "the maximum righting lever (GZ) shall occur at an angle of heel preferably more than 30°, but never less than 25°". The stability rules of the IMO class and regulations are based on the premise that "the greater the initial stability the safer the ship". If this is true for static stability, the situation is very different when dealing with the ship's dynamic stability. A high initial stability offers a hard roll (natural

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
CONTAINER	4	3	2	4	5	3	6	4	4	5	40
PASSENGER	12	8	4	5	3	7	7	8	10	4	68
RO-RO	10	5	8	6	1	3	4	2	5	4	48

FIGURE 1 - SUMMARY TABLE OF THE NUMBER OF LOSSES PER TYPE OF SHIP FROM 20006 TO 2015.

short roll period). This condition, however, increases the probability of resonance in the shorter waves and consequently produces a longer roll. The increase in acceleration caused by high initial stability, with regard to cargo stowage, is addressed in IMO Code CSS (2011) and the category rules (e.g. ABS 2012, DNV GL 2015). On the other hand, the IMO Code IS 2008 considers qualitative safety with regard to the regulations of initial stability, stressing the importance of avoiding too high an initial stability. This code mentioned in part A – Obligatory Criteria, 2.3 – the weather criteria for winds and extreme rolling. Its described tables and formulas are based on data of ships that have: a) B/d less than 3.5; b) (KG/d-1) between -0.3 and 0.5; and c) T less than 20s, where T is the roll time, B is breadth, KG is the height of the center of gravity and d is the average draft in the ship's frame. It is easy to see that the megaships do not fit these criteria. This is why the document states that for ships outside those limits, the angle of roll (f1) could be determined by using experimental models. Since the document does not cover all ships and current hazards, the IMO is drafting the Second Generation of Intact Stability Criteria (2016) that now cautions excessive acceleration.

A pilot must bear in mind the following basic knowledge

1. The shape of ship beacons

Figure 2[2] shows the curves of the righting arm for five different shapes of hull with the same metacentric height, freeboard and displacement. The GM figures are important when considering the total stability curve, but are not the only indicators of the ship's stability.

Ship II's stability curve is shorter than that of ship I. This means that the angle of broaching of ship II is less. This occurs because, even if both have the same breadth, the draft of ship II is smaller. Ship I has "U" markers, while ship III has "V" markers. Although both have the same initial stability, the static stability curve of ship III is shorter, and the righting levers are smaller due to the shape of its side. Nowadays there are few merchant ships with IV and V-type sides; V sides can, however, be found in aircraft carriers, and IV type in some warships. Ship V has larger righting levers and curves than ship IV.

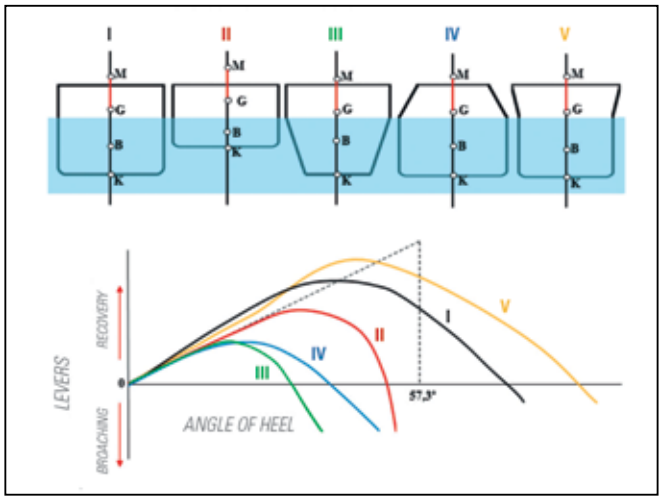


FIGURE 2 – DIFFERENT SHAPES OF SIDES AND THEIR STABILITY.

2. Yaw heeling moment at high speed

If the operator suddenly orders "rudder hard to one side", the rudder heels into the curve, since the force exerted on the rudder bladeis directed outside and is applied below the waterline (figure 3). As the ship moves forward in an arch, however, the centripetal force (MV2/R with M being the body mass, V the velocity and R the radius of the curve) created by the flow of water around the hull, acts on the hull center (thrust) inside and below the ship's center of gravity, a moment that cause the ship to heel outward. For the balance, there should be an equal force in the opposite direction, called centrifugal force, which acts on the center of gravity (G). The resulting heel motion depends on the angular velocity and transverse stability of the ship. The angular velocity (w) can be determined by V/R, where V is the ship's velocity and R the curvature radius. For the same type of ship the maximum angle of heel is a function of velocity, drift angle, mitigating the roll and intensity of the maneuver moment. In other words, it depends on the metacentric height (GM), the distance between the centers of gravity and hull (BG), the ship's velocity and curvature radius. If we are to take a modern large container ship as an example, L = 295m, B = 40m, C = 13m, GM = 0.75m, sailing in a circle with 0.75 miles of radius at 14 knots, the heel experienced could be over 3 o (figure 4) to produce an increase in draft of 1.03m. Amendments to the criteria of the maximum heel angle on the curves of code IS 2008 (SDC 2/INF.5 12 Dec 2014) show heel studies for GM = 2.5m and 3.5m, but the results are somewhat discouraging. This reveals how important it is to take on board the relevant information.

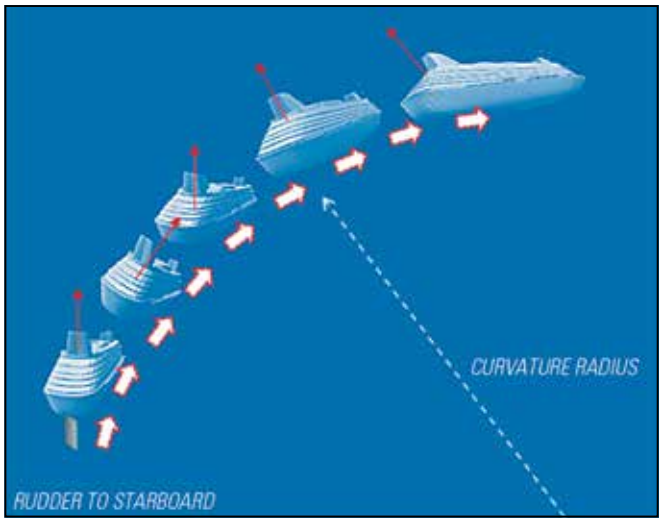


FIGURE 3 – HEELING OF SHIP WITH RUDDER FULL TO STARBOARD.

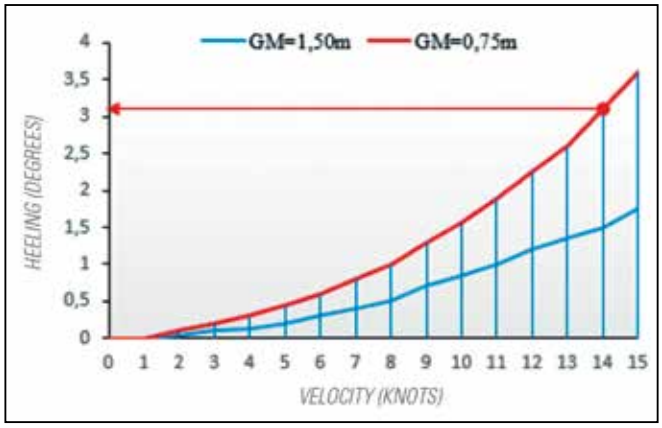


FIGURE 4 – HEEL IN CURVE PER VELOCITY.

3. Heeling due to severe wind and swell

When a ship carries containers on deck (or in the case of a ro-ro, or even a cruise ship), it is under lateral wind pressure, which results in a heeling lever due to the wind. The worst condition occurs when there is a beam wind. Generally strong winds are accompanied by a swell, which leads to increasing the angle of roll leeward. Under the criterion of MSC.267(85), with a steady wind the angle of heel should not 16° or 80% of the angle of deck edge immersion (whichever is less). The heeling lever resulting from the pressure of a gust of wind should also be considered. Figure 5 relates the draft increase to the heel angle. The formula $\{\Delta T = T\cos\theta - 1 + 12B \times \sin(\theta)\}$ was used, where ***T*** is the draft, ***B*** breadth and θ the heel angle. If we take the Madrid Maersk

as an example, 58.6m in breadth and 12.5m in draft, the increases in draft for heels of 10° and 15° would be 4.90m and 7.30m, respectively. This corresponds to percentage increases of 39.2% and 58.4%. As we know, this type of ship has a sail surface of 16,000m², which means large heel motions when exposed to the wind pressure. This effect could become considerably hazardous when approaching a port in a heavy swell.

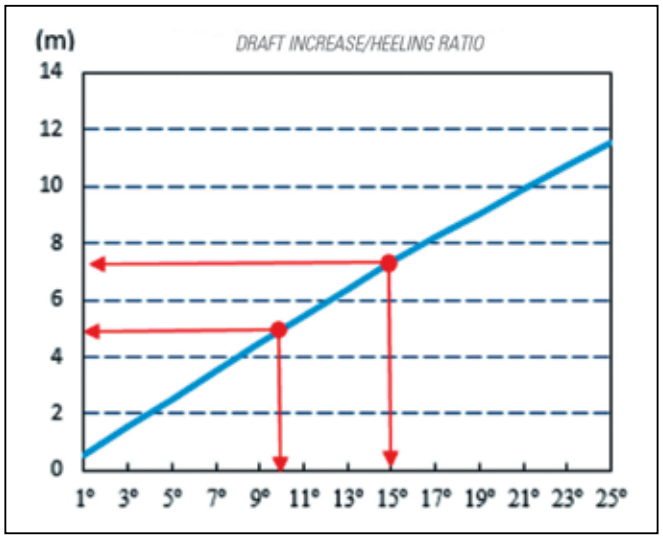


FIGURE 5 – DRAFT INCREASE/HEEL RATIO (BREADTH = 58.8M).

4. Increase in draft with pitching

When a ship is sailing on the sea the draft increases not only with rolling but also with pitching, and sinkage. To determine the draft increase caused by pitching ***(ΔTp)*** we may use the following simplified formula: ***{ΔTp=12L×sin φ +[T×cos φ]–T}***, where ***T*** is the draft, ***L*** length and *φ* angle of pitch. Although the draft has no virtual effect on the calculations, the results are quite sensitive to the ship's length. The overall lengths (Lpp) were considered in the results in the table in figure 6 in order to compensate the extra length of the keel of any

Lpp m	1° pitch	2° pitch	3° pitch	4° pitch
150	1.31	2.62	3.93	5.24
200	1.75	3.49	5.24	6.98
250	2.18	4.36	6.54	8.73
300	2.62	5.24	7.85	10.47
350	3.05	6.11	9.16	12.22
400	3.49	6.98	10.47	13.96

FIGURE 6 – CALCULATING THE INCREASE IN DRAFT PER ANGLE OF PITCH DUE TO SHIP'S LENGTH.

bulbous bow. The angles of pitch considerably affect the under keel clearance (UKC). If we take the example of a large container ship, say 350m in length, a small pitch of 2° implies a 6.11m increase in draft, which means that, the larger ships become, any slight tilt in relation to the horizontal could entail substantial increases in apparent draft. Moreover, these slight moments can be hard to estimate accurately in a ship in motion. We should also bear in mind that the sinkage motion could generate changes to the trim to cause pitching.

5. Parametric rolling: the loss of intact stability

The phenomenon of parametric rolling is caused by a periodic variation in the righting moment in the waves, depending on the weather, characterized by a drop in stability when the ship is on the crest of a wave and an increase in stability when in the trough of a wave. When a ship sails in a swell, with the sea at the bow or stern, the submerged part of the hull (living works) is altered. These variations could become very significant if the wave's length is close to the ship's length. When the wave trough is near amidships, the waterline becomes greater compared to that of a calm sea, since it includes the expansion of the top part of the bow (narrow below and widening upwards), the panel stern quite wide at the top and the wall-type side amidships. However, when the crest passes amidships, the waterline is exactly the opposite and quite small. So, the lower the waterline, the lower the GZ is also (figure 7).

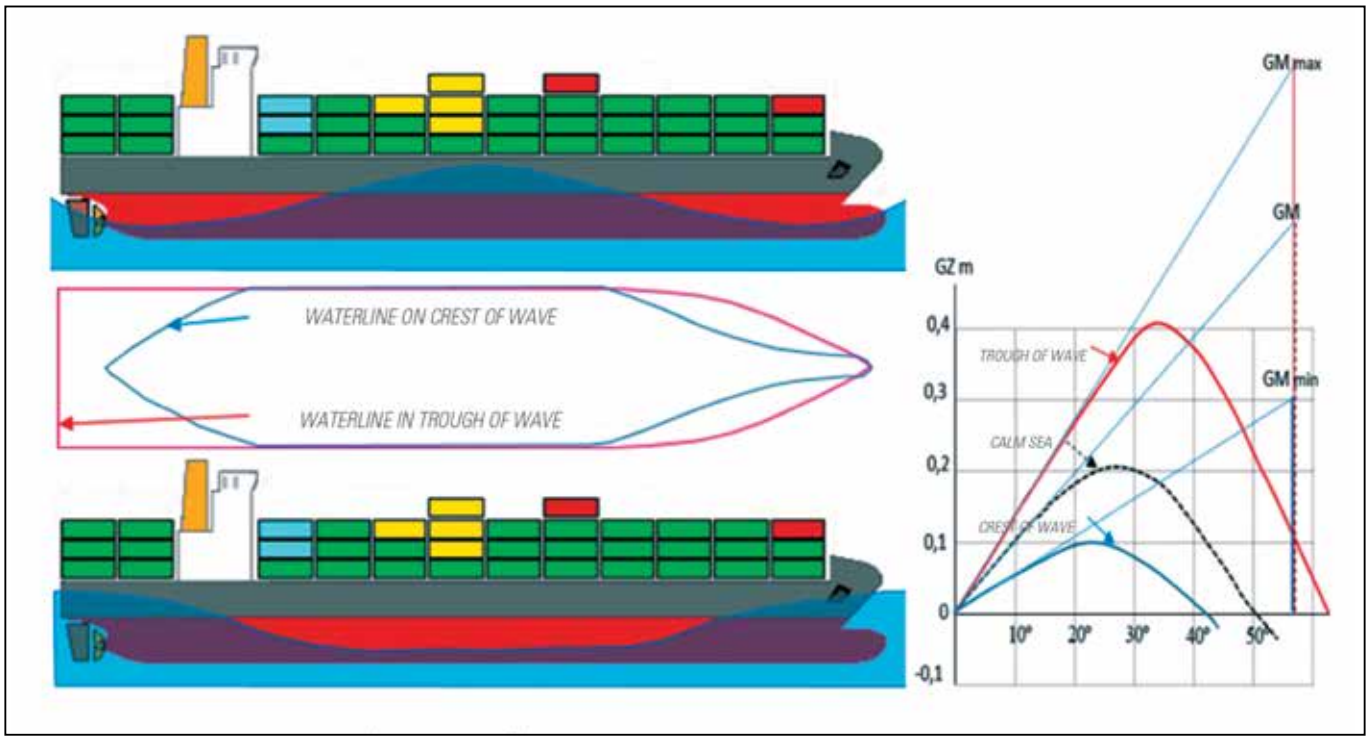


FIGURE 7 – WATERLINE AREAS ON THE CREST AND TROUGH OF THE WAVE AND THEIR RIGHTING LEVERS.

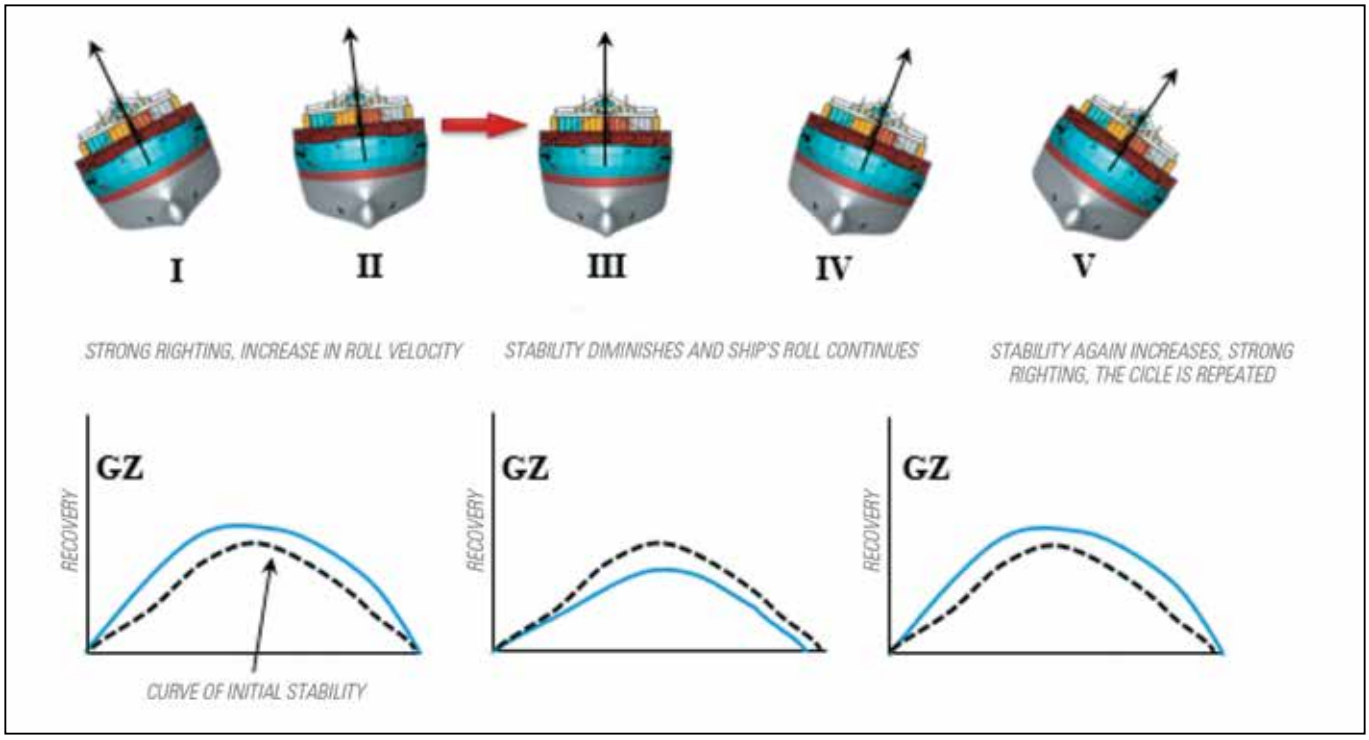


FIGURE 8 – FORMATION OF PARAMETRIC ROLLING.

Whenever the ship rolls when in the trough of a wave, the increase in stability produces greater righting levers GZ (recuperation) (figure 8 I). 3 When the ship returns to the right position (figure 8 II), its pitch velocity is faster due to the additional righting moment caused by the increased stability. If at this point the ship is on the crest of the wave (figure 8 III & IV), stability drops and the ship pitches even more to the opposite side due to the increase in the pitching motion and less resistance to pitching (figure 8 V). After the trough of the wave passes amidships again, when the ship reaches its maximum range, stability again increases and the cycle is resumed. So, the angle of pitch increases continuously. Note that the amidships roll is associated with the passage of a full wave. That is, the complete roll cycle responds to two wave cycles (figure 9).[3] If, however, any pitching (or roll) moment is also applied (for example, a side gust of wind, effect of a short crested wave or centrifugal force caused by the heading control), the ship could gain a larger angle of roll or even capsize.

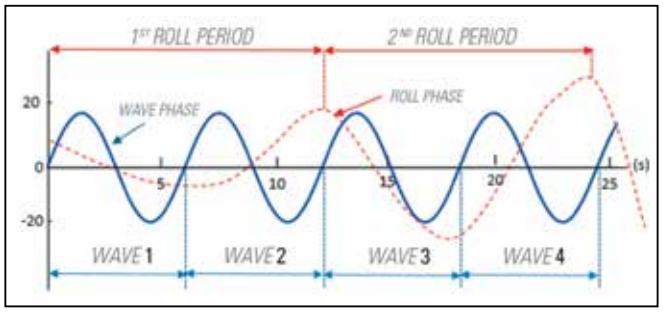


FIGURE 9 – COMPARISON OF THE WAVE PERIOD WITH THE SHIP'S PITCH PERIOD.

With regard to the so-called loss of intact stability, this is a phenomenon of a single and prolonged reduction in the GZ curve on or near the crest of the wave. This situation might occur when with stern or quarter seas, the ship encounters a single large wave with velocity close to its own. The dynamics of this phenomenon are different for the parametric roll, but are close in size and duration of the variations in the waterline area, when the wave passes by the ship. Above all, while parametric roll requires several waves for the phenomenon to occur, loss of intact stability only needs one wave. To prevent or minimize these problems, although we are unable to alter the side, we can always alter the ship's course and speed. If the waves speed past the ship, the GM reduction periods will be shorter, thereby preventing development of the roll. Fast accelerations generated by parametric rolling raise major concerns regarding the safety of modern container ships; because of its violence, parametric rolling could cause the loss of containers, machinery failure, structural damage and even lead to the ship capsizing. Figure 10 clearly illustrates the consequences of rolling in container ships.

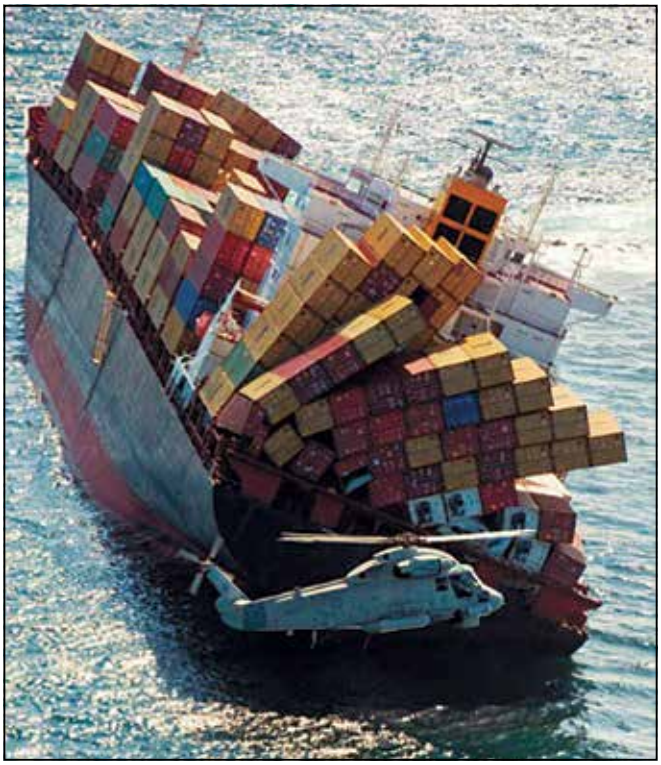


FIGURE 10 – CONSEQUENCES OF THE ROLL. SOURCE: NEW ZEALAND DEFENCE FORCE.

Conclusions

Hence the statement: how a large ship could be unsafe. Handling large ships can become quite hazardous if we fail to take measures against the dangers. The phenomena described herein can lead to catastrophic events. Certainly numerous pilotage organizations have already assumed this idea of risk in accordance with ISO 9001/14001: 2015, 6.1 – actions to address risks and opportunities.

It is our obligation, however, when assessing the shipment situation, to ask as far as we deem necessary about the ship's conditions, in order to minimize any foreseeable dangers, in the light of what has been discussed herein to provide some input for a good risk analysis.

[1] Fairplay, March 29, 2017.

[2] Adaptation by the author of: UFF – Mecânica do navio – Estática – Parte III [UFF – Ship mechanics – Statics – Part III]

[3] Adaptation of author from: Development of Second Generation Intact Stability Criteria. Naval Surface Warfare Center, Carderock Division. Hydromechanics Department Report.

** The author is captain of the Portuguese Merchant Navy, retired from the Lisbon Port Pilotage. Has a master's degree in Port Management, post-graduation in Maritime Transportation, Port Management and Intermodal Shipping, a course in*

Higher Studies (CESE) in Maritime Administration and Management, diploma in Maritime Management and Technologies and various courses on ship maneuvering simulation. Currently is consultant as a port technical specialist of Lloyd's Register Quality.

Paris MoU Finds Navigation Campaign Results Satisfactory

The Paris MoU has released its final report into its Concentrated Inspection Campaign (CIC) on Safety of Navigation conducted last year, saying the overall result was satisfactory.

The campaign was held from September 1 to November 30, 2017, and member states focused on compliance with ECDIS requirements, verifying the minimum standards for navigation equipment and including familiarity with the equipment. Navigation equipment has always been considered an inspection item for PSC inspections, but regulations on navigation equipment have undergone frequent changes, and deficiencies concerning navigation equipment, around 6.21 percent over a six year period, have been noted as high.

During the CIC, a total of 4,288 inspections were carried out involving 4,217 individual ships. The overall CIC detention rate was 3.5 percent (146 ships were detained). The CIC-related detention rate was 1.1 percent (47 ships were detained).

Ships from 87 flag states were inspected during the CIC. The highest number of ships detained for CIC-related issues were from Panama (nine), followed by the Marshall Islands (four), the Russian Federation (four) and Togo (four). The highest percentage of ships detained however were Albania (50 percent), followed by Egypt (25 percent), Ukraine (14.3 percent) and Togo (10.8 percent).

The overall number of CIC-topic related deficiencies reported per inspection was 0.18. The Report concludes that the CIC has provided sound evidence that the industry has achieved a good level of compliance with the specific provisions inspected during the CIC of SOLAS Chapter V requirements pertaining to safety of navigation. The 1.2 percent CIC-related deficiency rate (average number of deficiencies reported per inspection) was considered "satisfactory."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Rewriting the rules?

A recent decision in the UK Court of Appeal appears to upend the conventional wisdom about the application of Colregs in the approaches to narrow channels.

For generations, the staple diet of a young professional who studies to qualify as a watch-keeping officer onboard a ship has been the Collision Regulations 1972 (as Amended).

The Colregs, as they are fondly known, are often leant verbatim, and form the basis of any decision making process which prohibits the development of a close quarters situation between two or more vessels.

It appears that this is not the opinion of the English Court of Appeal, who have decreed that this baseline of vessel interaction, does not, and what's more, never did apply to vessels when navigating in the approaches to and from a 'Narrow Channel'. This case has significant public interest for all masters and pilots who approach and depart major estuaries and narrow channels, and it is worth looking at the decision in more detail.

What is a narrow channel?

It is when a vessel is navigating in the approaches to a narrow Channel, where the Court of Appeal departs from the Colregs. The central question is:

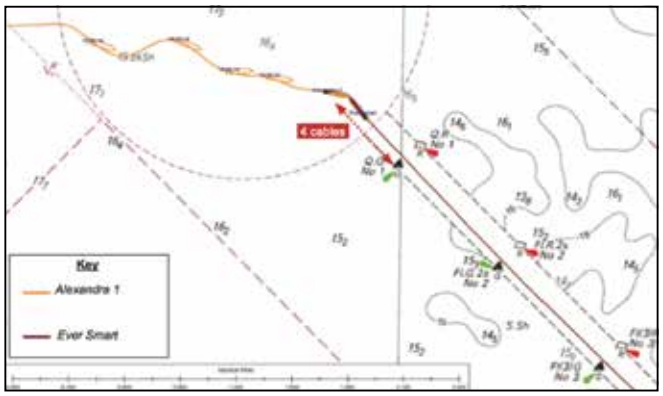
Do the 'Crossing Rules' (15,16 and 17) apply or not, to a vessel openly crossing from port to starboard, openly showing a green starboard light and maintaining a steady compass bearing whilst navigating in the approaches to a narrow channel?

This question was applied in the High Court and the Court of Appeal when the container vessel Ever Smart was in collision with the tanker *Alexandra 1* while approaching the Jebel Ali Channel, UAE in February 2015. (See MAIB Report 28/2015).

The clear answer of both courts was that the Crossing Rules did not apply when vessels were navigating in the approaches to a narrow channel.

At this stage it may assist the reader if the meaning and context of the term 'narrow channel', or even what constitutes the approaches to a 'narrow channel' could be defined. After all, Rule 9 of the Colregs is devoted to the subject of narrow channels. Sadly, there is nothing within the Colregs, or anywhere else, which could assist with the interpretation of the term.

Facts of the case



The Approaches to the Jebel Ali Channel.

The 300 metre long container vessel *Ever Smart* departed her berth and proceeded outward bound with her pilot in the Jebel Ali Channel.

During this period, the Master of the 269 metre long tanker *Alexandra 1* misheard a VHF conversation from the port VTS. He thought the VTS had directed the Ever Smart to alter course to port for him as he approached the channel. He maintained his course and increased speed to approach the entrance to the channel. The pilot of the Ever Smart disembarked to the pilot cutter whilst the vessel was still outward bound in the channel and then proceeded towards *Alexandra 1*.

The collision occurred 4 cables outside the channel whilst the pilot was in transit between the vessels, and amid much shouting to both vessels to go hard to starboard.

The Court's decision

It is easy to become distracted at this point by the actions of the port VTS, the Masters and the pilot. The Courts wanted to know whether the Crossing Rules applied before looking at other relevant issues such as maintaining a good lookout and the application of Rules 5 and 9, which were also considered by the Court when apportioning blame.

The decisions of the Courts are often made after considering other similar cases and the application of common law. Here the Court focussed on a number of cases as well as expert evidence provided by court assessors both in the High Court and Court of Appeal. The Court posed questions to the assessors regarding both the situation in the case and a hypothetical scenario where the *Alexandra 1* was approaching the channel from the opposite direction, showing a red aspect. The judgement expressed by the Court of Appeal was:

"....both sets of answers show that the crossing rule has no role to play in the approaches to a narrow channel"

Their decision was that the actions of converging vessels in the approaches to a narrow channel are governed by Rule 2. In the case that the *Alexandra 1* had been approaching from the opposite her navigation would also be:

"governed by rule 2, thereafter by rule 9 (once within the channel)."

This judgement is applicable only in the approaches to a narrow channel (which is not defined) and not on the high seas, but it still appears to me to foster subjectivity and uncertainty, when as a full time pilot, I am confronted by this situation in the approaches to the channels of the Thames Estuary, sometimes on a daily basis.

I have canvassed opinion over a wide area, and the consensus is that the Crossing Rules should always apply when convergence is going to take place outside the confines of a narrow channel. Where the Crossing Rules cannot be applied effectively – for example at a pilot boarding area - then Rule 2 may be applied as an alternative, but only after clear and unambiguous bridge to bridge agreement from both vessels.

Continued over on page 24.

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Traffic Separation Schemes

There are many instances where Traffic Separation Schemes form the lead-in to a pilot boarding area and a narrow channel. Whilst navigating within a TSS, the advice is quite clear and contained within MGN 364, stating that *"Vessels proceeding in a TSS do not have priority over crossing traffic."* So within the confines of a TSS alone, the Crossing Rules will apply.

In the complex traffic systems that serve many of the major European Rivers it therefore becomes even more important to understand what collision avoidance rules apply in defined and specific circumstances. I am not confident that this judgement has achieved this objective.

The TSS and approaches to Wandelaar and the approaches to narrow channels.

The Courts also supported a second argument against the application of the Crossing Rules: namely that *Alexandra 1* was not maintaining a sufficiently defined course for the Crossing Rules to apply and make her the give-way vessel. The ruling of the Court of Appeal was:

"The mere fact that there was a risk of collision through convergence, is not determinative of whether the crossing rules apply".

For me, a vessel on a steady bearing and showing a green crossing aspect on my port bow would clearly be a give-way vessel.

Thankfully, a third argument was discounted. That *Alexandra 1 was restricted in her ability to manoeuvre* by the fact she was embarking a pilot. The basis of disqualifying this argument was that the pilot did not get close enough to board *Alexandra 1*.

"She was not restricted in her ability to take such action by reason of embarking the pilot because that work had not commenced (and never did commence)...."

I had not considered this scenario before and do not wish to contemplate it whilst approaching a busy pilot station at night. I feel uneasy about any possibility of further interpretation of what might define *a vessel restricted in its ability to manoeuvre in the future,* but this door seems to have been left open.

Differing opinions

The considerable experience of the MAIB in collision investigations drew different conclusions regarding the Ever *Smart/Alexandra 1* collision. By statute, the MAIB findings cannot be considered by the Courts. This is to protect the functions of the MAIB in carrying out investigations without assigning blame and also to prevent the future occurrence of similar events. However, their expert views deserve an airing if only to highlight their contrast with the Court's decisions.

In particular, the MAIB does not consider the application of the Crossing Rules at all, but focuses on Rule 5, the use of scanty VHF information and the actions of the VTS, pilot and Masters. My own view is that all participants in this collision believed that the Crossing Rules did apply once the vessels were outside the channel, based in part upon the VHF calls for *hard to starboard.*

This case has significant public interest for all Masters and pilots who approach and depart major estuaries and narrow channels. The rules of application must be clear. We shall wait in the approaches to this fairway to see which channel the mariner is directed to. But the old phrase *'Let's pass conventionally'* may soon have little meaning if specific passing arrangements have to be made between all vessels navigating in the 'approaches to a narrow channel'. Once we have a definition of what constitutes a narrow channel and its approaches, that is.

For those wishing to read the judgment in full, it is available free online at:
http://www.bailii.org/ew/cases/EWCA/Civ/2018/2173.html

The MAIB accident report can be found at:
https://bit.ly/2DAQr6O

By: Captain Chris Bordas CMMar, Medway Pilot.

Marie-Claire Jenkins leaves IMPA...

Marie-Claire Jenkins after leaving IMPA, and the Wellington for the last time in October after 12 years of hard work.

She has moved to Scotland to take up a post as PA to a Hotel Executive.

We thank her for her efforts with IMPA and wish her well for the future.

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13/ Espinherio, Averio, Portugal
14/ Quinoa, Bordeaux, France
15/ Interceptor, Venice, Italy
16/ Ursula, Roenne, Denmark
17/ Skua, Liverpool, UK
18/ Joa vaz corte real, Horta, Azores
19/ Foxtrot, Valeta, Malta
20/ Alvaro de ornelas, Horta, Azores
21/ Failte, Cork, Ireland
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