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RISK WATCH

Britannia
The Britannia Steam Ship Insurance Association Limited

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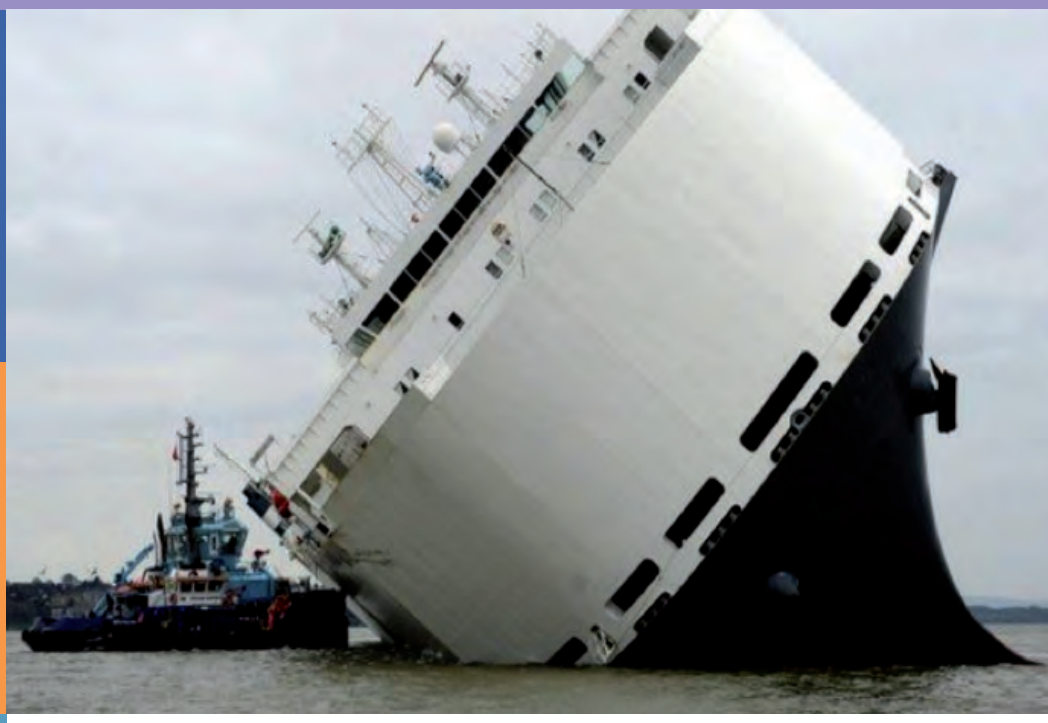
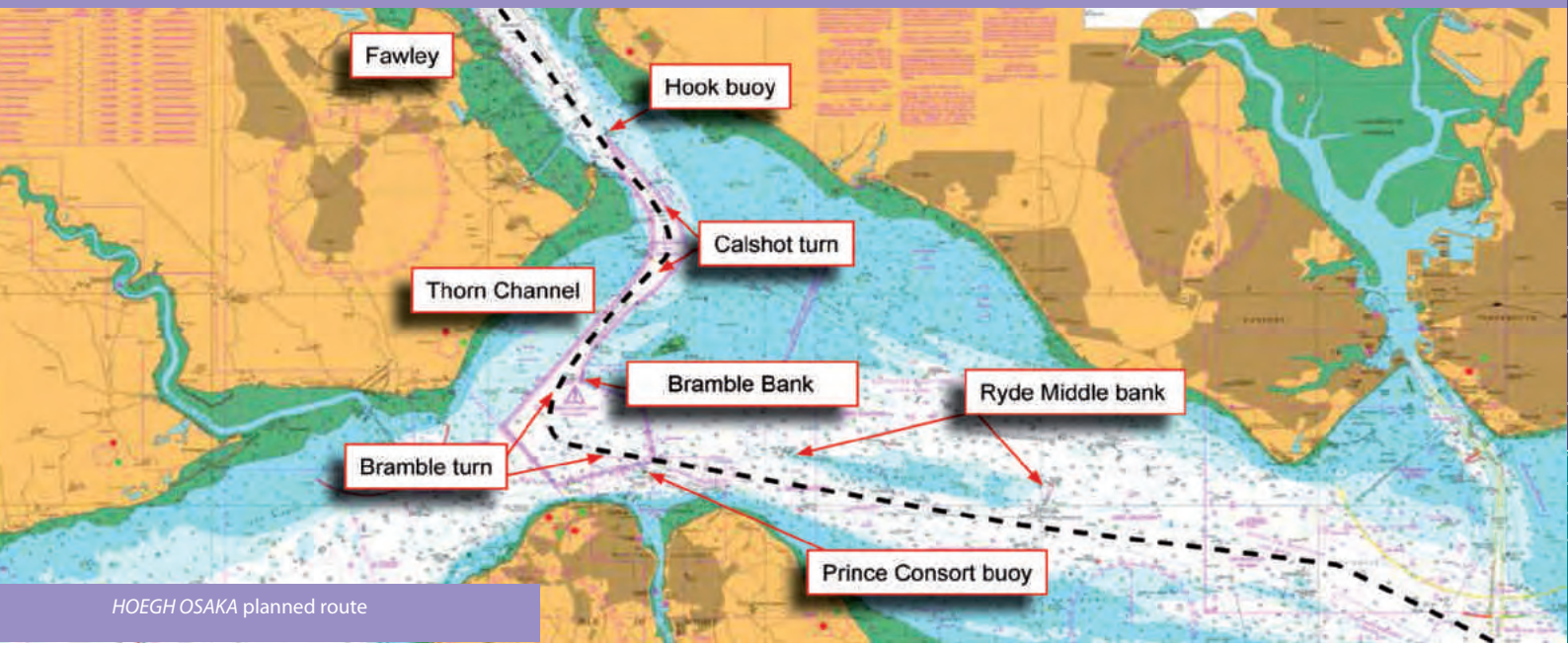


The UK Marine Accident Investigation Branch (UK MAIB) has recently published its report on the *HOEGH OSAKA*, a pure car and truck carrier (PCTC) which grounded on Bramble Bank in the Solent shortly after departing Southampton in January 2015.

This article highlights the main issues raised in the UK MAIB report. Although the report will certainly have been studied by the operators of PCTCs (especially the parts of the report relating to the stability of the ship on departure and the procedural defects surrounding the departure) there are many other more general issues contained in the report that will be of interest to all owners, operators and crew.

The *HOEGH OSAKA* was on a regular route from Europe to the Middle East. On the voyage in question, the normal port rotation was changed and the usual last port call of Southampton was amended to be the first call. On arrival at Southampton, the chief officer met the port captain and told him that the pre-stowage plan had not been received by the ship. In fact, the master had been sent the pre-stowage plan the day before but had failed to pass it to the chief officer. The port captain then met the stevedore supervisor to discuss cargo operations but the chief officer was not present. Later that day, the chief officer calculated the ship's departure condition based on the pre-stowage plan and reported a metacentric height (GM) on departure of 1.46m. As the loading progressed, the port captain made arrangements to load additional 'high and heavy' cargo (cranes, bulldozers and other construction machinery/vehicles) that was on the reserve cargo list. This was not discussed with any of the ship's officers.

Navigation and seamanship



HOEGH OSAKA planned route

Complacency causes grounding? (continued)

The chief officer spent most of his time in port in the control room keeping the ship upright and in the correct trim for the stern ramp. Heeling tanks no. 3 were used to keep the ship upright and the trim was controlled by transferring ballast between fore and after peak tanks. The ballasting operation could be undertaken remotely from the cargo control room where there were also remote tank gauges. However, only the fore peak remote tank gauge was operational at the time. The remaining gauges had not been working properly since July 2014 and were deemed 'low priority' as soundings could be obtained manually. The last full recording of all ballast was approximately two weeks before the Southampton port call. Ballast movement between tanks was estimated based on the time spent transferring ballast. The pumping capacity was 7 tonnes per minute and therefore this amount was simply multiplied by the number of minutes and this led to some uncertainty as to the quantity of ballast on board and its exact location. No ballast was taken on at Southampton.

The *HOEGH OSAKA* was fitted with a Loadstar loading program for the purposes of calculating stability, trim and draughts and this program was approved by Lloyd's Register. This required the quantities of fuel, lubricating oil, ballast, fresh water and stores to be entered into the program. Vehicles on cargo decks should have been input in terms of their mass and actual Vertical Centre of Gravity (VCG). The last entry in the Loadstar program was found to be for the Southampton arrival condition. It was also found that a default VCG had been entered; it was that of the deck, rather than the actual VCG of the vehicles.

The stevedores provided labour to drive cargo on and off the ship, to secure the cargo on board and to provide a final tally and stowage plan prior to departure. The stevedores used an electronic system to record the loading of the vehicles on board from a bar code on each car. Despite this available technology, the final tally provided to the ship was an estimated weight. This estimated weight recorded in the stowage plan/final cargo tally was 5549 tonnes. However, the actual weight loaded was 5814 tonnes.

When the cargo operations were complete, the deck cadet recorded the draughts which were adjusted by the chief officer with a standard adjustment for the stern ramp (which was still on the quay) to produce departure draughts of 9.0m forward and 8.4m aft. (These draughts were recorded incorrectly on the bridge and on the pilot card as being 8.4m forward and 9.0m aft). After the pilot boarded, the ramp was raised and this immediately caused a list of around 7° to starboard. This was well in excess of the 1 to 2° normally experienced. The list was corrected before departing the berth.

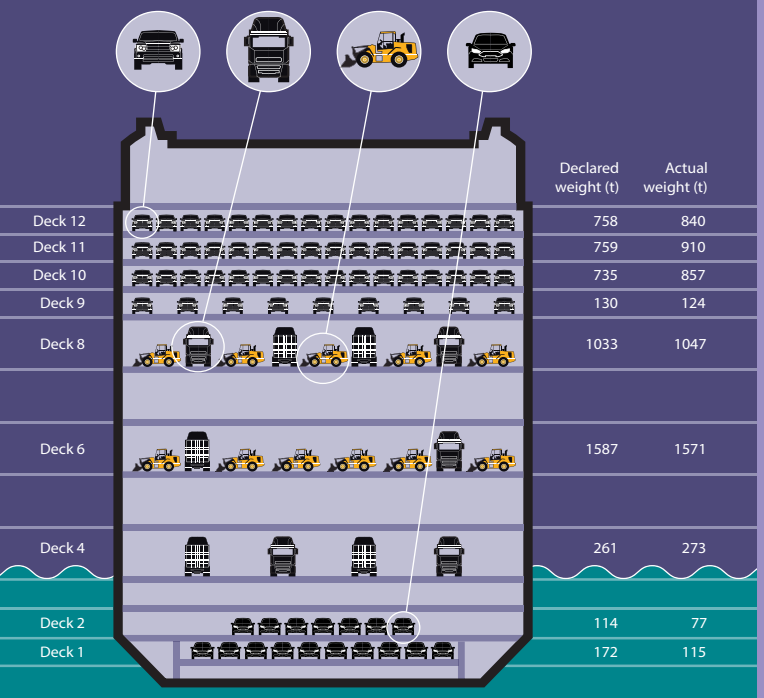
After unberthing, the chief officer and cadet went to the cargo control room to calculate the ship's departure stability. Because of the many changes between the pre-plan and final load, the chief officer decided to re-enter all the cargo figures rather than amend the pre-plan condition. Once the calculations were done, the chief officer became concerned that the GM was less than his earlier calculation had predicted. The deck cadet was sent to sound the peak tanks.

The chief officer, noting the increased displacement, anticipated an additional 300 tonnes of ballast in these tanks. Rather than question the declared cargo quantity, the regular practice was to adjust the assumed ballast quantity to compensate for the difference between the calculated and actual draughts taken before sailing.

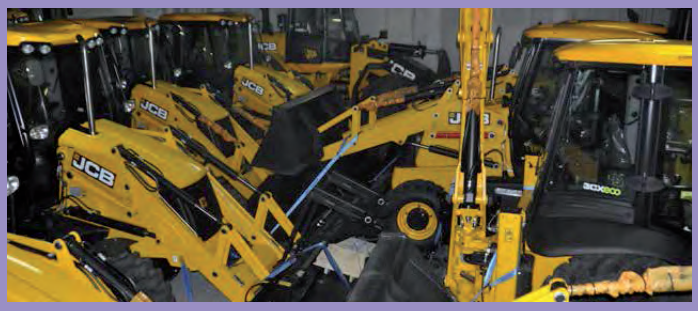
In the meantime, the ship was making 12 knots and had completed the Calshot turn into the Thorn Channel. The next turn from the Thorn Channel around the West Bramble buoy required a sharp (120°) alteration of course to port utilising 10° of helm. This normally resulted in a heel to starboard but on this occasion the heeling continued to increase beyond what was normally expected. The engine was ordered to stop but the starboard list increased to 40°, exposing the rudder and propeller.

On the bridge, the master slid uncontrollably along the deck to the starboard bridge wing door. The pilot, helmsman and third officer managed to maintain their positions by wedging themselves between consoles and tables but for a time they were not able to reach or operate those consoles, including the VHF. Below decks, a crewman broke an arm and a leg falling 18m along a cross alley way. Several other crew suffered minor cuts and bruises.

Some of the large cargo units broke free from their lashings and shifted which resulted in the ship's hull being breached. Sea water flooded into deck 6 and then into lower decks.



Indicative deck plan including weights



JCB cargo indicating various securing points

Deck 6 – starboard side cargo damage

The guard boat 'SP' (which was leading *HOEGH OSAKA* to prevent any small craft impeding its navigation) reported to VTS that the *HOEGH OSAKA* had developed a serious list and required assistance.

The severe list and the exposure of the rudder had resulted in the rate of turn to port increasing. The very fortunate result of this was that *HOEGH OSAKA* grounded on Bramble Bank. It is possible that *HOEGH OSAKA* would have capsized if she had not grounded. The pilot, realising further heeling of the ship had been prevented by the grounding, ordered the first tug on the scene to push the ship further aground.

Most of the crew gathered on the high side of the open deck but the crew in the engine room had to climb out using an emergency escape hatch. The chief officer and cadet, who had both been in the cargo control room, managed to reach the ship's control centre, along with the second officer, and they passed out life jackets and immersion suits. The electrician and the bosun both had to jump into the sea to avoid being trapped and they were rescued by shore-based lifeboats. Other crew were successfully evacuated by the emergency services.

Cargo operations

The roles of the relevant officers were defined in the ship's SMS as follows:

Master: shall hold overall responsibility for the ship and her safety at all times.

Chief officer: is directly responsible to the master for the safety of the cargo operations, and the chief officer shall provide a positive report to the master prior to each and every departure. The ship meets all the requirements of the stability booklet.

The SMS also stated that tank soundings should be taken and recorded daily.

The role of the port captain, as provided for in the owner's 'Cargo Quality Manual', was to form a link between the ship's crew, the voyage planning manager, the local agents and the stevedores. The owner's internal cargo operations manual stated:

'Pre-plan loading and stowage of cargo; Plan loading and stowage of cargo; Supervise cargo operations according to plan; Ensure loading of ship in accordance with regulations and standards; Make, distribute after load report; Report on ship performance.'

The Cargo Quality Manual provided that the port captain's role was to ensure that the cargo was loaded efficiently without harm or damage to crew, stevedores or ship.

The port captain received booked figures, consolidated them and produced a pre-stowage plan for each port. The plan would show the proposed stowage position of individual units on each of the decks. The plan was passed to the ship, stevedores and local agents. It also stated that any alterations to the agreed stowage plan were only to be made if authorised by the port captain or the ship's master.

UK MAIB: conclusions

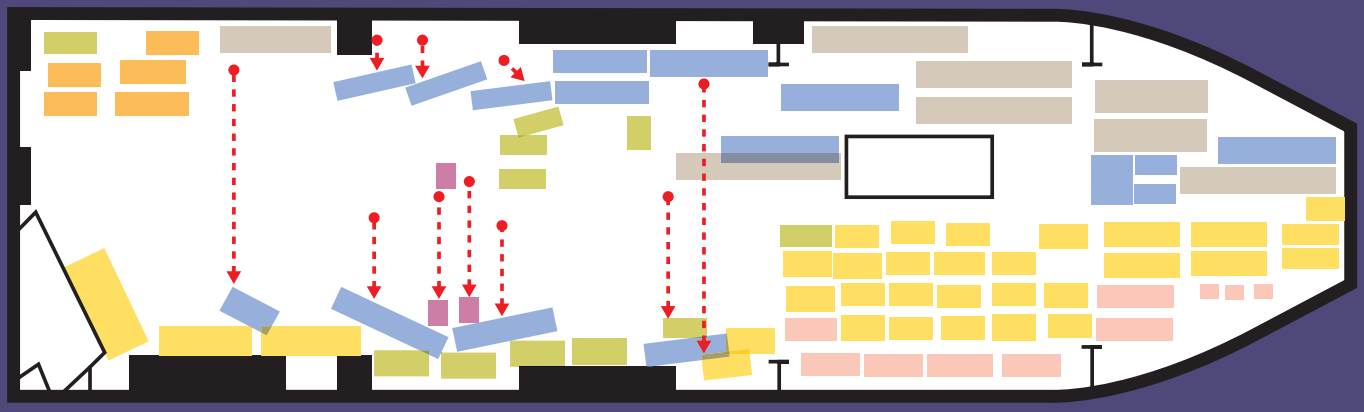
- The *HOEGH OSAKA* heeled heavily to starboard while rounding the West Bramble buoy as a result of insufficient stability.
- The ship had inadequate stability which had not been identified because accurate stability calculations had not been performed before the ship sailed.
- The *HOEGH OSAKA's* departure stability was positive but she had insufficient residual stability under IMO requirements and had a 0.6m bow trim which would have been detrimental to her manoeuvring.

Reasons for insufficient stability

The insufficient stability was due in varying degrees to the following:

1) The chief officer under-estimated the importance of accurately calculating the ship's stability as it had not previously been a cause for concern. Various errors were identified: no allowance was made for the actual vertical centre of gravity (VCG) of the cargo; ballast quantities on board were only estimated; no priority was given to calculating the ship's stability before departure; and no attention was paid to warning signals, such as the 7° list occurring after the ramp was lifted.

2) The port captain arranged the loading of additional cargo (approx. 600mt) from the reserve list without informing either the captain or chief officer.



Deck 6 – original stowage and direction of shift of displaced cargo

Complacency causes grounding? (continued)

3) The actual cargo weight and stowage were significantly different from the final tally provided to the ship. The cargo weights supplied were mostly estimated rather than actual, even though the actual weights were available to the stevedores.

4) Operational manuals did not properly address the relationship between the ship command and the port captain. This led the port captain to see little value in involving the chief officer and the chief officer in turn believed that he had no authority to question the pre-stowage plan.

5) The master was given the estimated departure stability condition by the chief officer but the master was unaware of how the stability had been calculated or what information had been used to make the calculations.

6) The fact that the company had been slow to repair the tank gauges led to a similar feeling of 'low priority' by the chief officer who resorted to estimating the ballast tank quantities.

7) Instruction about how to use the loading computer was not included in the familiarisation training given when joining the ship. It was also not featured in the owner's two day training course for senior officers assigned to the PCC/PCTC fleet.

Other safety issues identified

The UK MAIB received witness and other anecdotal evidence which suggested that the practice of not calculating the actual departure stability prior to sailing was common in the pure car (PCC) and pure car and truck sector (PCTC) and not just on board *HOEGH OSAKA*.

HOEGH OSAKA had a cargo securing manual (CSM) on board which was accepted by Lloyd's Register on the basis of previous approval. The CSM stated that for web lashings the maximum secured load (MSL) should be 70% of the breaking strain and that the MSL should be not less than 10,000kg and should have suitable elongation characteristics. The heavy duty web lashings on board *HOEGH OSAKA* had a MSL of 5,000kg which was half the required strength recommended by the IMO. Neither the port captain nor the stevedores had access to, or knowledge of, the ship's CSM.

Lack of communication

The port captain saw the planning and supervision of the loading as his responsibility. As he was implementing the pre-stowage plan for Southampton and was also performing the loading in the next two ports he considered that there was little value in involving the chief officer.

The chief officer had instructions to raise any problems that he found with the pre-stowage but the port captain had no instructions to involve the chief officer in any stowage preparations. The ramp meeting (which was required to inform all parties of the loading plan) went ahead without the chief officer.

The master had not provided the chief officer with the pre-stowage plan when it was emailed to the ship the day before but only when the ship had berthed at Southampton.

The company did not deem it necessary to repair the tank gauges. This may have contributed to demoralising the chief officer and also detracted from the importance of calculating an accurate departure stability which is critical. There was complacency throughout the operation as stability had not previously been considered as a problem.

Conclusion

An incident is rarely the product of one single factor. In this case there were many causative factors which were largely ignored by the master, chief officer and port captain. This was mainly because they all presumed that as there had been no problems with stability in the past, there would not be any problems in this instance and so the individual issues were not dealt with and corrected.

This presumption was in spite of the fact that with this particular loading of cargo there were many differences to the normal routine: the change in rotation of the ship; the addition of cargo without informing master or chief officer; and the ship listing to 7° and not the expected 2° when the ramp was raised. None of this appeared to be a cause for concern or caution for the parties involved.

Following their investigation, the UK MAIB report has recommended some significant changes to procedures and operations for the charterers, ship managers and stevedores involved in this case.

The full UK MAIB report can be found at the following link:
https://www.gov.uk/government/news/hoegh-osaka-report-published

ECDIS: Australia asks officers to demonstrate proficiency

INTERCARGO have drawn attention to the investigation by the Australian Maritime Safety Authority (AMSA) into the ability of crews to use their ECDIS and the extent to which ships' safety management systems (SMS) reflect the important role of ECDIS in their navigation and operation.

The investigation was prompted by a port state control (PSC) detention in May of the bulk carrier *AFRICAN ALKE* in Pinkenba, Australia due to the fact that bridge watch-keeping officers were unable to show that they could use ECDIS to an appropriate standard.

INTERCARGO have summarised AMSA's findings and published them in a recent paper (III 3/5/5) which has been submitted to the IMO.

Purpose of the investigations

Where ECDIS is listed in the Record of Equipment on the ship's safety certificates as the primary means of navigation, the PSC officers will ask the ship's navigating officers to demonstrate basic operation of the ECDIS equipment fitted on board.

The ship's officers will be asked for verification of the validity of Electronic Navigational Chart (ENC) permits, the presentation library and latest updates and should demonstrate passage planning, route checking and appropriate safety settings, such as safety depth, safety contour, look ahead time and angle, under keel clearance, ability to record bearings and position fixing.

The PSC officers may examine the ship's safety management system to confirm that procedures for the operation of ECDIS are incorporated into the system and that these procedures are being followed.

Where the PSC officers determine that the ship's officers are not proficient in navigation, or cannot navigate safely due to lack of appropriate and up-to-date charts, or other equipment operation issues, action is taken to bring the ship into compliance.

Deficiencies identified so far:

• the safety management system of a ship fitted with ECDIS provided detailed instructions for passage planning and route monitoring using paper charts, but it did not mention whether ECDIS was the primary means of navigation;

• passage planning is often being carried out on ECDIS using only small scale ENCs and no route checking is being carried out. As a result, there have been numerous instances of planned routes transiting through areas to be avoided, passing perilously close to shoals/coastlines, passing through traffic separation schemes in the wrong direction and other dangerous planned routes;

• the inability of ships' navigating officers to perform basic squat and under keel clearance calculations to determine safety depths and inappropriate setup of safety settings. For example, during one recent inspection it was found that the safety depth had been set and locked at 10m, when the departure draught of the vessel was 14.5m;

• settings being 'locked out' to prevent changes being made;

• complete reliance on Global Navigation Satellite System (GNSS) as the sole source of positioning information, and no use of alternative methods to verify the ship's position, even on coastal voyages when in sight of land;

• ships' navigating officers unable to demonstrate calculation of compass error by taking bearings of the sun or other celestial bodies;

• ineffective voyage planning. In recent examples, there was a failure to observe the requirements of designated shipping areas, areas to be avoided and traffic separation schemes;

• use of inappropriate, uncorrected and/or outdated nautical charts including ENCs;

• use of unofficial and small-scale charts that are inconsistent with SOLAS regulations V/27 and 34.1 as well as resolution A.893 (21);

• disabling of ECDIS audible alarms or not ensuring the ECDIS audible alarm is operational at the commencement of a voyage; and

• limited understanding of the capabilities and limitations of the electronic navigation equipment being used and the nature of the information provided on displays. This includes errors in 'mode awareness' where data is relied upon inappropriately (for example, dead reckoning positions being read and used as GPS (Global Positioning System) calculated positions).

The paper from AMSA (III 3/5/5) can be provided upon request.

Loss prevention poster campaign: COLREGs 2(a),13,15 and 16

Overtaking

Rule 13 of the International Collision Regulations directs any vessel overtaking any other vessel to keep out of the way of the vessel being overtaken. An overtaking vessel is defined as a vessel coming from a direction of more than 22.5 degrees abaft the beam of the vessel being overtaken and no subsequent change in the bearing will make the overtaking vessel a crossing vessel within the meaning of the rules or relieve her of the duty of keeping clear of the overtaken vessel until she is finally past and clear. The rationale is that the overtaking vessel has the option of slowing down but remains the give way vessel until finally past and clear. It is important to note that this rule applies to any vessel overtaking and is not restricted to power driven vessels.

The scene in the poster shows the view from the bridge as the vessel approaches a traffic separation scheme at 20.5 knots with vessels ahead and to either side, together with a crossing vessel on the starboard horizon. The junior officer asks the master on which side he should pass the vessel being overtaken. The decision on which side to pass the overtaken vessel is left to the discretion of the overtaking vessel, but the obligation is on the overtaking vessel to keep clear.

The master explains the advantages of overtaking on the starboard side which will present the vessel with more options if any unforeseen crossing situations develop during or after the overtaking manoeuvre. Other things to take into consideration should include planned alterations of course, the proximity of fishing vessels or navigation hazards and the individual circumstances of the case.

The decision to overtake in narrow channels, and the implementation of the overtaking manoeuvre, should be considered carefully and discussed thoroughly with the pilot (if there is one on board). It is important to consider potential abort positions for the manoeuvre. The master should consider the size of the vessels involved, the available width of the channel, the distance required to pass clear of the overtaken vessel and the proximity of moored vessels likely to be passed during the overtaking manoeuvre. The master should also consider the combined effect of the interaction between the vessels and the effect of squat on the draught, which will increase dramatically as speed is increased. If, when under pilotage, at any time the master is uncomfortable with the proposed manoeuvre, even in a compulsory pilot area, these concerns should be expressed to the pilot and the overtaking manoeuvre declined.

Rule 2
Responsibility

a) Nothing in these Rules shall exonerate any vessel, or the owner, master or crew thereof, from the consequences of any neglect to comply with these Rules or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

b) In construing and complying with these Rules due regard shall be had to all dangers of navigation and collision and to any special circumstances, including the limitations of the vessels involved, which may make a departure from these Rules necessary to avoid immediate danger.

Rule 13
Overtaking

a) Notwithstanding anything contained in the Rules of Part B, Sections I and II, any vessel overtaking any other shall keep out of the way of the vessel being overtaken.

b) A vessel shall be deemed to be overtaking when coming up with another vessel from a direction more than 22.5 degrees abaft her beam, that is, in such a position with reference to the vessel she is overtaking, that at night she would be able to see only the stern light of that vessel but neither of her sidelights.

c) When a vessel is in any doubt as to whether she is overtaking another, she shall assume that this is the case and act accordingly.

d) Any subsequent alteration of the bearing between the two vessels shall not make the overtaking vessel a crossing vessel within the meaning of these Rules or relieve her of the duty of keeping clear of the overtaken vessel until she is finally past and clear.

Rule 15
Crossing situation

When two power-driven vessels are crossing so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way and shall, if the circumstances of the case admit, avoid crossing ahead of the other vessel.

Rule 16
Action by give-way vessel

Every vessel which is directed to keep out of the way of another vessel shall, so far as possible, take early and substantial action to keep well clear.

Hold flooding: rubbish blocking bilges

In a recent case reported to the Association, holds were flooded, despite the fact that the bilges were being properly monitored.

In the case in question, hold no. 4 of a small container ship flooded to a depth which affected cargo in several containers loaded on the tank top. Sounding of the bilges indicated that no water was present. Investigating surveyors could find no fault in the structure or piping of the ship nor any problem with the bilges. The conclusion was that a small amount of rubbish left by stevedores had blocked the bilge grating covers which meant that accumulated water from rain and snow could not flow into the bilge well and therefore built up in the bottom of the hold.

It is unusual for any significant quantity of rubbish to be found in the holds of container ships. It is also the case that there are few times when the tank tops are completely clear of cargo and so there are not many occasions when the hold can be properly swept.

The lesson to be learned from this case is that every opportunity should be taken by the crew to clean up small amounts of rubbish and refuse from the holds, even if the hold is partially loaded. In addition, stevedores need to be discouraged from throwing their rubbish into the hold and should dispose of it properly.

For a detailed article dealing with the issue of bilge monitoring, Members are referred to the December 2015 edition of Risk Watch which carried a longer article on this subject: http://www.britanniapandi.com/assets/Uploads/documents/Risk-Watch-Vol-22-No-3.pdf

Rubbish on tank top plating

Starboard bilge well

Aft bulkhead of no 4 hold

Disposal of cargo residues

At the recent 69th session of the IMO's Environment Protection Committee (MEPC 69) it was decided not to renew or continue the provisions of MEPC.1/Circ 810 (the circular).

The circular permitted the discharge of cargo hold wash containing residues of solid bulk cargoes considered as harmful to the marine environment (HME) in certain special areas, a practice that would usually not be allowed. This exemption expired on 31 December 2015. It was originally introduced to acknowledge the fact that shipowners were having difficulty finding adequate port reception facilities (PRF) ashore at terminals receiving HME residues.

This issue was highlighted in a report from INTERCARGO which drew attention to the fact that the decision not to renew the exemption was taken despite the fact that it is generally accepted that adequate PRF to receive HME residues are still not available. INTERCARGO also noted that, during informal discussions with the International Association of Ports and Harbours (IAPH) on the subject of PRF for HME cargo residues, many ports said they were not considering developing such facilities as it would simply not be economical.

A cargo is considered as HME if it fails any of seven specified criteria, as set out in the UN Globally Harmonized System of Classification and Labelling of Chemicals (UN GHS) as the following: acute toxicity, chronic toxicity, carcinogenicity, mutagenicity, reproductive toxicity, repeated exposure of specific target organ toxicity (STOT) and the presence of plastics, rubber or synthetic polymers. Metal concentrates shipped in bulk are the most commonly carried HME cargoes. It is the shipper's obligation to verify whether or not any cargo may be considered HME and this should be clearly identified in the shipper's cargo declaration which is required under SOLAS.

INTERCARGO recommends that before accepting a HME cargo it should be made clear that the charterer accepts all costs arising from the landing of dry residues and washing water containing such residues and charterers should also accept any delays or off-hire incurred due to a lack of PRF in the scheduled discharge port or next port of call.

One of the objections of those IMO member states which opposed the continuation of circular 810 was that no official notifications had been made to the IMO regarding the lack of adequate PRF. INTERCARGO believes that it is important that ships report to the IMO and to their flag state all instances when difficulties are found landing HME cargo residues. There is a standard format to make such notifications which is contained in MEPC.1/Circ.834 'Format for reporting alleged inadequacies of port reception facilities'.

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Miscellaneous

Publications

Passage Planning Guidelines, 4th Edition
GBP 95.00
This focuses on the appraisal and planning stages of voyage planning using traditional methods, paper charts and ECDIS. This 4th edition notably contains updates on passage planning with ECDIS and incorporates best practice as ECDIS evolves and becomes more established on the modern bridge.
http://goo.gl/kieMs5

Thomas' Stowage – The Properties and Stowage of Cargoes (eBook) 7th Edition
GBP 95.00
This 7th edition of Thomas' Stowage retains the format of previous editions, thus providing quick reference to procedures and individual commodities: Safety, Techniques and Systems, Commodities, Damage and Claims and Procedures.
http://goo.gl/kieMs5

The ECDIS Manual GBP 95.00
This contains essential information for ships making the transition from paper charts to digital navigation. This reformatted edition of The ECDIS Manual (2012) has been written in conjunction with ECDIS experts, manufacturers, international organisations and leading societies to support a ship's transition to digital navigation.
http://goo.gl/kieMs5

ECDIS Record of Training and Familiarisation
GBP 15.00
This will allow officers to record the details of courses undertaken. It also provides a series of check lists that will guide the individual through the process of familiarisation with the ECDIS fit once onboard. It should be used in conjunction with the manufacturer's operating manual and any other familiarisation aids available. Once completed, it will provide an audit trail if needed to satisfy Port State Control requirements.
http://goo.gl/kieMs5

Shipping Regulations and Guidance Issue 16
GBP 75.00
This covers the latest updates to international regulations for the maritime industry. New regulations from the IMO are presented in a clear and concise format to help shipowners, managers and masters easily recognise and comply with the regulations that are relevant to them. It also provides a list of guidance issued by Flag States, P&I Clubs and Class Societies. This is complemented by articles from industry professionals on current topics.
http://goo.gl/kieMs5

The ICS Bridge Procedures Guide: 5th Edition
GBP 135.00
This is widely acknowledged as the principal industry guidance on safe bridge procedures and is used by masters, watchkeeping officers, companies and training institutions worldwide. The Guide is referenced in the footnotes of several IMO Conventions. The new edition now addresses the 2010 amendments to the STCW Convention introducing enhanced Bridge Resource Management training for all officers in charge of the navigational watch.
Publications@marisec.org

Editor's message We are always looking for ways to maintain and increase the usefulness, relevance and general interest of the articles within Risk Watch. Please forward any comments to: **rwatched@triley.co.uk**