RISK WATCH

JUNE 2021

LNG AS A FUEL AN OVERVIEW
GROUNDING THE ROLE OF ECDIS
CHIRP CONFIDENTIAL HUMAN FACTORS INCIDENT REPORTING PROGRAMME
PARAMETRIC ROLL A RECAP
CLAIMS AND LEGAL IMPORTANT CASES DISCUSSED

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A MESSAGE FROM THE EDITOR

As we continue to adjust to the new working patterns that have emerged with the pandemic, we have also had to adapt the way in which we communicate with our Members, with most of our communications moving to a virtual setting. Our Loss Prevention webinars have proved very popular, with a wide range of topics and speakers, using our knowledge and experience from within the company and also working with external maritime experts from around the world.

We also held a very successful Britannia Bitesize virtual event for Members in June. As we were unable to hold our usual P&I Training Week in the London office, we instead organised a virtual event for less experienced and new starters at our Members. The event, broadcast in two 90 minute sessions over concurrent days, consisted of pre-recorded short, introductory talks by senior Britannia executives to give viewers an overview of the Club and its various teams and departments as well as live question and answer sessions with all the speakers from each day. We were delighted that around 300 Members and colleagues from around the world joined Britannia Bitesize. The event was recorded so please do get in touch if you would to access the recordings.

And of course, we continue to issue our regular publications. In this edition of *Risk Watch* we have a variety of articles and case studies as well as a digest of recent legal cases. We are very pleased to share the thoughts of Jeff Parfitt, Director of CHIRP Maritime, as he explains the importance of this confidential hazardous reporting programme and examines its work around the world. This links well with the case study of a grounding in Indonesia, where we look at what went wrong and examine the lessons that can be learned about over-reliance on ECDIS in these situations.

As always, the Loss Prevention team have been busy with articles on the use of LNG as a fuel and a useful overview of the phenomenon that is parametric rolling. We round off with a digest of legal cases which have been summarised by some of our expert in-house FD&D lawyers and claims handlers.

As always, we welcome your comments and suggestions so do get in touch with the Communications Team at Britannia.

CLAIRE MYATT
Editor

We hope you enjoy this copy of Risk Watch. We will be looking for ways to maintain and increase the usefulness, relevance and general interest of the articles. If you have any ideas or comments please send them to: britanniacommunications@tindallriley.com

LNG

AS A FUEL – AN OVERVIEW

THE USE OF LIQUEFIED NATURAL GAS (LNG) AS A MARINE FUEL IS NOT A PARTICULARLY NEW CONCEPT. IT HAS BEEN USED AS A FUEL BY LNG CARRIERS SINCE THE 1950s. HOWEVER, OVER THE PAST DECADE, ITS USE HAS STEADILY INCREASED AND BECOME MORE WIDESPREAD. WHILE THIS HAS BEEN MOST COMMON WITHIN THE FERRY, OFFSHORE, CRUISE AND CONTAINER SEGMENTS, BULK CARRIERS FUELLED BY LNG ARE NOW ALSO BEING COMMISSIONED AND THERE WILL UNDOUBTEDLY BE MORE IN THE FUTURE.

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The main reason for this increase has been the introduction of stricter air pollution regulations for the shipping industry. These have included the limitation of sulphur content in marine fuels, with the introduction of the 0.1 % sulphur limits in the sulphur emission controlled areas (ECAs) in various regions around the world. There has also been the introduction of the International Maritime Organization's (IMO) 2020 global sulphur cap of 0.5%, together with its initial strategy for the reduction of greenhouse gas (GHG) emissions from ships. LNG has been seen as a way to comply with the MARPOL Convention's air emission requirements on both Sulphur Oxides (SOx) and Nitrogen Oxides (NOx). LNG is a mixture of hydrocarbons, predominately methane (80 – 99%), and emits virtually no SOx or particulate matter compared to heavy marine fuel oils, with a reduction in NOx emissions of up to 95%. However, methane is a potent GHG, which traps 86 times more heat in the atmosphere than the same amount of CO_2 over a 20-year time period[1].

In addition to the reductions in SOx, NOx and particulate matter, in recent years LNG has also become more cost competitive compared to conventional marine fossil fuels.

Despite LNG's environmental benefits, there are a number of safety and operational risks. From a loss prevention perspective, if not properly managed, the risks of using LNG include:

LNG
AS A FUEL – AN OVERVIEW

FOOTNOTES
[1]The International Council on Clean Transportation – The climate implications of using LNG as a marine fuel published 28 January 2020.
[2]IMO (2017) Resolution MSC.391(95) (adopted on 11 June 2015), Adoption of 'The International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels' (IGF Code). See also the International Association of Classification Societies (IACS) Interpretations of the IGF Code, accessed at: **ow.ly/wmH330rLGEv**
[3]DNV webinar LNG as ship fuel Where are we and what comes next? delivered on 11 May 2021, accessed at: **ow.ly/UTYt30rLGKy**
[4]A measure of the interchangeability of fuel gases and their relative ability to deliver energy.
[5]Society for Gas as a Marine Fuel (SGMF) (2020). Gas as a marine fuel – an introductory guide, accessed at: **ow.ly/RKLa30rLGEE**

CONTAINMENT LNG needs to be contained at extremely low temperatures. LNG is derived from natural gas which is extracted from beneath the earth's surface and is formed by cooling the gas to about -162°C (atmospheric pressure) where it condenses into a cryogenic liquid compressed in volume by 600 times. Therefore, to minimise the risks of damage to property, such as the risk of brittle fracture, it is vital that the materials used for an LNG system have been certified for cryogenic temperatures and that the system has built-in pressure relief functionality. Failure of the system or material will also impose a serious risk to the crew as exposure to these extreme low temperatures could result in severe cold burns. The requirements for the design, installation and control of onboard LNG fuel systems are set out in 'The International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels' (IGF Code) which came into force in January 2017[2]. This includes detailed requirements for containment and different types of storage tanks, which can be either pressurised (Membrane tanks or Type A and B independent tanks) or non-pressurised (Type C independent tanks).

LEAKAGE Although LNG itself is neither flammable nor toxic, any release of it is hazardous, as the cold natural gas cloud that forms condenses into a mist containing methane vapours. These vapours are highly flammable and even a small ignition source nearby can ignite the gas cloud, which will rapidly burn back to the source of the leak. Therefore, Members need to have a robust system in place to detect any leakages. This should include the implementation of suitable safeguards, along with adequate procedures to ensure that any leakage is swiftly detected, and necessary precautionary measures enforced to prevent escaping vapours being ignited. The term 'methane slip' is often mentioned in the context of LNG fuels, but this refers to any methane passing unburnt through the engine. Various technologies are currently under development to support methane slip reduction[3].

FUEL MANAGEMENT Given the different nature of handling LNG compared to conventional fossil fuels, the use of LNG poses a new set of operational hazards when handled on board as part of the daily operation of the engine room. It is essential that Members identify any operational risks associated with the use of LNG as fuel. Proper training in understanding and safely managing these risks should be provided to the crew in order to avoid any damage to property or personal injuries.

The use of LNG as a fuel also imposes risks which may have a commercial impact, such as potentially costly off-hire situations. Members should plan ahead and carry out due diligence in order to mitigate these risks.

QUALITY The ISO 23306:2020 – *'Specification of liquefied natural gas as a fuel for marine applications'* standard has recently been developed by ISO but is yet to be commonly used within the industry. In the meantime, most LNG when supplied, is accompanied by a specification sheet which may include details of its composition, density and Wobbe Index[4]. Members should be careful and consult their engine makers to determine the right parameters. A thorough assessment of any new LNG provider should be conducted by Members before they are appointed as a supplier for their ships.

SHIP PERFORMANCE Engine performance is also affected by the composition of the LNG, which therefore needs to be taken into account when planning the voyage. The gas composition is quantified using three main variables[5]:

CALORIFIC VALUE – the heat content of the fuel – hydrocarbons with more carbon atoms give out more heat per molecule when combusted, compared with methane.

METHANE NUMBER (MN) – used to define the resistance to detonation or knock of a gaseous fuel in Otto cycle engines. Pure methane has an MN of 100 and pure hydrogen an MN of 0. A higher MN value indicates a better gas fuel quality, and if the MN is too low, the engine performance can be adversely affected.

WOBBE NUMBER – a flow parameter that quantifies the amount of heat that flows through a burner nozzle of a specific size in a given time.

INFRASTRUCTURE The global infrastructure for providing LNG as bunkers is still relatively limited compared to conventional fossil fuels but it is becoming more available worldwide. For example, the port of Singapore recently conducted its first ship-to-ship LNG bunkering. The lack of availability may result in operational disruption, and could

even lead to a ship becoming inoperative. This could result in disputes with charterers and customers as a result of the ship being unable to fulfil its obligations and deliver the cargo within the agreed timeframe. Therefore, the use of LNG requires more detailed long term planning to ensure that sufficient LNG is available at the appointed bunkering locations.

BUNKERING

LNG bunkering operations require additional preparation, as this type of bunkering poses a variety of different and potentially more hazardous risks compared to bunkering using conventional fossil fuels.

A thorough risk assessment should be conducted prior to the bunkering operation in order to identify any associated risks and appropriate mitigation measures, with a major concern being the risk of leakage, as detailed above.

An LNG Bunker Management Plan should be available. This would include a compatibility assessment carried out between the Receiving Ship (RS) and the supplier facility before the start of the bunkering operation. Due to the complexity of LNG bunkering, this would cover a wide range of issues, including the provision of adequate safety measures and emergency procedures by both parties, including an appropriate Emergency Shutdown (ESD) system, which should be capable of being triggered manually from multiple onboard locations as well as automatically.

In addition, safety and security zones should be established. The safety zone is a designated area surrounding the bunker manifold of the RS where only personnel essential for the bunker operation are permitted. The security zone should also include a larger area in which ship/port traffic is monitored. Together the two zones should reduce the risk of outside interference with the LNG bunkering operation and limit potential damage in case of leakage.

The International Society of Classification Societies (IACS) document: LNG Bunkering Guidelines (**www.iacs.org.uk/download/1962**) provides recommendations for the responsibilities, procedures and equipment required for LNG bunkering, including the recommended minimum baselines for a compatibility assessment and bunkering risk assessment.

Simultaneous operations (SIMOPs), such as cargo operations and stores embarkation can be allowed by the port authority and/or the safety regulator, provided appropriate risk assessments and safety management systems are in place to mitigate the additional hazards.

'The International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels' (IGF Code) also outlines the regulatory requirements for bunkering and includes a standard proforma for a Bunker Delivery Note (BDN) for LNG fuels.

In addition to the IACS guidelines above, further information on LNG bunkering is provided by various organisations, including:

American Bureau of Shipping (ABS) – LNG Bunkering: Technical and Operational Advisory
ow.ly/w1UK30rLGGd

ISO 20519:2017 – Ships and marine technology – Specification for bunkering of liquefied natural gas fuelled vessels.

Society for Gas as a Marine Fuel (SGMF) (2017) Safety Guidelines – Bunkering, version 2.0 FP07-01.

World Ports Sustainability Program Bunker Checklists, downloadable at: **ow.ly/iFRR30rLKoE**

CONCLUSION

The future for LNG as a marine fuel is uncertain. Despite its environmental advantages, it is seen by some as an interim solution, due to its high methane content. The belief is that it will only be used until renewable non-fossil fuels are available on a sufficient scale and at a competitive cost. However, as the technology matures this hurdle may be overcome. What seems certain is that the current increase in ships using LNG as fuel is likely to continue for some time, especially as the global infrastructure improves and LNG becomes more easily accessible. Our experience here in the Britannia Loss Prevention Department shows that, with the proper management, LNG can be used as a safe alternative to conventional fossil fuels.

CHIRP

CONFIDENTIAL HUMAN FACTORS INCIDENT REPORTING PROGRAMME

CHIRP MARITIME, PART OF THE CHIRP CHARITABLE TRUST, IS INCREASINGLY RECOGNISED AS THE WORLD'S FOREMOST CONFIDENTIAL HAZARDOUS REPORTING PROGRAMME FOR THE GLOBAL MARINER. IT IS THE TRUST AND RESPECT THAT HAS EVOLVED BETWEEN THE MARINER AND OUR TEAM OVER THE LAST 19 YEARS THAT IS PIVOTAL TO OUR SUCCESS. WITHOUT OUR REPORTERS, THERE IS NO PROGRAMME AND WE MUST CONSTANTLY STRIVE TO CHALLENGE AND SUCCEED ON BEHALF OF THE MARINER.

The significant difference between CHIRP Maritime and other organisations is that our programme receives the reports directly from the mariner, thereby ensuring that there is no sanitization of the report and no removal of the details between the reporter and ourselves.

Whilst we always encourage the reporter to use their company's SMS, we recognise that this is not always possible. Our personal contact with the mariner enables us to ascertain the accuracy of the report and credibility of the reporter and are able to identify malicious reports. From this point, we can then engage with the relevant parties and identify causal factors which are then promulgated through our publications.

On occasion, we are referred to as a whistle-blowing organisation but that is inaccurate, a pejorative term and does not properly represent the true ethos of our programme. We are a confidential reporting programme and as such we take the confidentiality of our reporter very seriously. We have a very secure IT system and engage in a robust vetting procedure. We also go to great lengths to dis-identify shipowners and operators, names of ships, Flag States and other matters that may identify individuals or companies.

Whilst our approaches and comments are not always welcome, we maintain that we are there for the mariner when every other option has failed and that we are the 'Voice of the Mariner' and therefore it is incumbent upon us to push back against organisations that may otherwise seek to ignore the individual.

This year has been particularly challenging. We are now more than 12 months into our global pandemic and our world may have changed irreversibly. The plight of seafarers trapped at sea continues – at the peak of the pandemic, there were more than 400,000 seafarers trapped at sea and 400,000 more ashore awaiting their berths. Even now there are approximately 200,000 seafarers currently onboard vessels beyond their contract and whilst this figure is significantly lower than at its peak, it is still significant and unacceptably high.

CHIRP Maritime was one of the first organisations to recognise the implications of the pandemic for a seafarer's mental health and produced a paper written by our Maritime Advisory Board member Dr. Claire Pekcan that was published in April 2020 with the support of Lloyd's Register Foundation. The paper highlighted seafarer well-being during the pandemic and the potential impact of factors such as fatigue and stress along with the acute and chronic health effects on safety issues, sleep, and physical disorders. The paper remains a significant study and can be downloaded from our website **www.chirpmaritime.org**

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During 2020 we noted a general decrease in reports, particularly over the period February to April. The reporting level then recovered significantly toward the end of 2020 and encouragingly, we have been able to sustain our level of reporting from previous years. Most noticeable was the number of qualitative reports. These have significantly increased over recent years. We now receive reports on major incidents including casualties and serious welfare issues and many of these reports can prove quite harrowing to read. Fortunately, we enjoy a good relationship with the International Seafarers' Welfare and Assistance Network (ISWAN). Our agreement extends to exchanging reports of relevance between the two organisations.

Our success can be attributed to the continuing and growing support of our core sponsors, and the quality of publications that we now produce. Our 'Insight Articles' are often written by expert members of our Maritime Advisory Board and every article undergoes rigorous scrutiny prior to being published in order to ensure accuracy and correct references. Such a process ensures a solid platform from which CHIRP Maritime is able to make statements and produce incisive reports.

We now engage at a higher level than in previous years, regularly attending advisory meetings with UK Government at Westminster, associated UK fishery association meetings and taking part in webinars for various maritime organisations. We also promote studies from major universities that would otherwise not gain traction. Our programme now features as a link on the United Nations Food and Agriculture Organisation website to highlight the plight of fishermen everywhere. We ask uncomfortable questions both of mariners and organisations. Often regarded as a pressure group, we now receive responses from Flag States that previously have ignored our position. This is indicative of the respect now enjoyed by the programme.

Our programme has an important role to play in enhancing and strengthening the maritime safety sector so that it can respond to the existing needs of the seafarer and raise safety standard practices. Britannia plays an important part in sponsoring the programme and promoting our work in the Far East, in particular by translating our Feedback publication into Tagalog and distributing it across the Filipino maritime platform. We aim to promote good practice and encourage collaboration and exchange, so as to create a positive solution that empowers seafarers.

GROUNDING IN INDONESIA – A CASE STUDY
THE ROLE OF ECDIS

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Figure 1 Ship aground with waves breaking on rocks

ON 9 JULY 2018, THE LIQUEFIED GAS TANKER *PAZIFIK* (38,853 GT) RAN AGROUND ON A SHOAL BETWEEN THE INDONESIAN ISLANDS OF BANTA AND KOMODO. THE SHIP SUSTAINED SIGNIFICANT BOTTOM DAMAGE IN WAY OF THE FOREPEAK AND BALLAST TANKS. THERE WAS NO POLLUTION BUT DAMAGE WAS SEPARATELY REPORTED TO THE CORAL REEF IN THE VICINITY OF THE GROUNDING.

The following description is based on the findings of Germany's Federal Bureau of Maritime Casualty Investigation's (BSU) investigation: **ow.ly/gFvw30rLGGp**

THE INCIDENT

On the morning of 9 July, *PAZIFIK* was two days into her voyage from Luwuk, Indonesia to Kwinana, Australia, having loaded 18,000 tonnes of ammonia. At 1018 local time, the third officer handed over the watch to the master, so that he could attend a video-based training course in the conference room. Also on the bridge was a lookout, who remained on watch with the master. Visibility was good and the wind was easterly, Beaufort Force 2-4.

PAZIFIK was on track in accordance with the passage plan, and was proceeding at full speed at approximately 15 kts. This leg of the voyage took the ship south from the Flores Sea to the Sumba Strait, via the Selat Sape, between the islands of Banta and Komodo. The passage plan had been prepared by the second officer prior to departure using the onboard PassageManager voyage planning software. The master had approved the passage plan and briefed all the deck officers.

While preparing the plan there had been some discussion regarding the route. The master had been with the company for 20 years and was familiar with a more westerly route via the Lombok strait. However, this route was 200nm longer than the route suggested by the software.

Based on the significantly reduced distance, the master and the second officer agreed on the route suggested by the software, making one amendment to the leg inside the Selat Sape. The suggested route passed between the small islands of Nisabedi and Lubuhtare, which were separated by only 1.5nm. The track was instead amended to pass west of Nisabedi, allowing for a wider passage of 2.5nm between that island and Banta **(Figure 2)**.

At 1024, the master observed several small fishing vessels approaching and switched from automatic to manual control. At 1042, the ship entered the Selat Sape and proceeded on a course parallel to the planned route, off track to the south by about 0.25 nm in order to avoid the fishing vessels in accordance with the COLREGS.

At about 1100, the third officer returned to the bridge, but the master retained the con and at about 1111, *PAZIFIK* grounded on a submerged rock at a speed over the ground of 18.1 kts **(Figure 1)**. No loss of cargo occurred and no crew were injured. Following transfer of cargo and ballast water, the ship was able to re-float five days later and proceed to Singapore under her own power for repairs.

THE CAUSE AND CONCLUSIONS

The ship was fitted with a Transas electronic chart display and information system (ECDIS), which served as both the primary and backup navigation system. The relevant electronic navigational chart (ENC) had been installed on 5 July 2018 and was the largest scale offered by the United Kingdom Hydrographic Office (UKHO) that supplied the ENCs.

The ENC displayed an isolated danger symbol near the point of grounding **(Figure 3)**, with supplementary information stating *'Underwater rock (always under water/submerged 1 MAR 2017)'* but with no additional depth information or nearby depth contours. In the absence of any other information, the officers planning the passage assumed that the depth of the isolated danger corresponded to that of the surrounding area of about 100m, and therefore posed no threat in terms of under keel clearance (UKC). A safety contour or further indication of depth around the isolated danger could have given them more warning about the nature of the hazard while planning the passage and the deviation from the track when the fishing vessels were encountered.

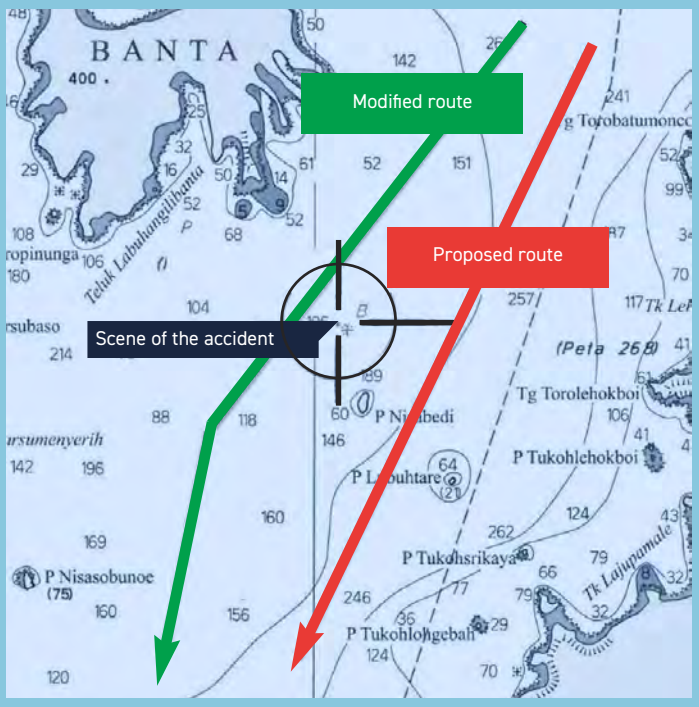

Figure 2 Annotated Indonesian navigational paper chart ID 295, scale 1:200,000 showing planned routes

Figure 3 ECDIS screenshot showing deviation from route planning up until the grounding

Although not carried on board, two Indonesian paper charts and two UKHO paper charts, BA 2903 and BA 2910 (which used the Indonesian charts as a basis) were available for the area, but these featured different symbols for the grounding location. The UKHO charts showed a more accurate 'rock awash', whereas one of the Indonesian charts, ID 295 **(Figure 2)** showed a rock symbol, but did not make it clear whether the rock was permanently submerged. The other Indonesian paper chart, ID 268-2, merely indicated a shallow area with a water depth of 9m. The ship's drafts at the time of the incident were 7.73m forward and 8.03m aft.

Although paper charts contain a survey source data diagram, ENCs incorporate details of the quality of the navigational data referred to as the 'category of zone of confidence' (CATZOC), which provides an indication of the accuracy of both positional and depth data. This can be shown in an ECDIS as an optional display setting or by using the cursor pick query function, and this information should be considered in conjunction with the cross-track distance (XTD) while planning a voyage.

The BSU investigation noted that the Data Quality Working Group at the International Hydrographic Organization (IHO) was developing guidance to help improve user awareness and the presentation of quality data following other incidents involving the use of ECDIS/ENCs. Document S-67, Mariner's Guide to Accuracy of Depth Information in Electronic Navigational Charts (ENC) was subsequently published in October 2020: **ow.ly/YQg330rLGGv**

This key document provides more in-depth knowledge regarding the interpretation of the depth information presented in an ECDIS. This includes guidance on the degree of confidence that mariners should have in the adequacy and accuracy of depths and positions in an ENC and is recommended reading for all ECDIS users. It further emphasises that navigators on coastal or international voyages should also consult any applicable guidance regarding national policies on the depiction of depth accuracy information in ENCs, such as Mariners' Handbooks and national hydrographic authority web sites. Improvements to the quality of the data in ENCs will be implemented with future format releases, including the intended replacement of the current ENC data format, S-57, with the new S-101 format.

The electronic version of the relevant UKHO sailing directions was available on board and described the passage east of Palau Banta as *'navigable, but... seldom used, other than by ferries and other local craft...'*. Furthermore, they also referred to a *'drying rock...small and dangerous; the breakers on it being indistinguishable from the normal overfills and sea conditions in the area'* in the position corresponding to the grounding **(Figure 1)**. Such information would routinely have been consulted during passage planning using paper charts. The correct description of the isolated danger would have immediately been recognised and the route probably not chosen if the relevant details in the sailing directions had been included in the ENC or at least separately considered during the passage planning.

PREVENTATIVE MEASURES

Following the incident, *PAZIFIK's* owner increased the shoreside scrutiny of passage planning and also reminded masters to consider any isolated danger indicated on an ENC as an actual hazard. The company stipulated that the Selat Sape should not be used as a future route. A further preventative measure included the provision of individual refresher courses in passage planning and the use of ECDIS, including its limitations. The owner also informed the UKHO about the discrepancy between the ENC and paper charts. Although the UKHO were not responsible for updating the ENCs of other nations, they subsequently forwarded the information to the Indonesian Hydrographic Office.

PARAMETRIC ROLL – A RECAP

THE RECENT CONTAINER STACK COLLAPSE INCIDENTS, IN PARTICULAR, THE LOSS OF 1,816 CONTAINERS FROM *ONE APUS* IN NOVEMBER 2020, HAVE BROUGHT THE TOPIC OF CONTAINER STOWAGE INTO THE SPOTLIGHT. THE CONSEQUENCES OF A CONTAINER LOSS INCIDENT CAN BE SIGNIFICANT, PARTICULARLY IN TERMS OF THE ENVIRONMENTAL IMPACT, THE VALUE OF THE LOST CARGO AND THE COST OF CLEAN-UP ACTIVITIES.

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The extent of the recent incidents has prompted increased scrutiny of this matter, including recent discussions at the International Maritime Organization (IMO) and other industry fora. This included Britannia's own webinar on the subject in January 2021: **ow.ly/VzxY30rLGGM**
Encouragingly, various joint industry projects[1] are being proposed to help the industry tackle the issues.

Parametric rolling has been identified as a possible contributory factor to container stack collapse incidents, and this article provides a recap of this phenomenon.

PARAMETRIC ROLLING – OVERVIEW

The motions and dynamic stability of a ship are influenced by a complex set of interacting factors. These include ship-specific parameters, such as the hull geometry and weight distribution, and operational factors, including the ship's loading and speed. Various external factors are also of significance, in particular adverse weather conditions, which can lead to a range of potentially dangerous dynamic effects, including surf-riding and broaching[2] and synchronous rolling[3]. However, one phenomenon has come to particular prominence in recent years – parametric rolling.

This is typically characterised by a series of sudden, large rolls resulting in very high acceleration forces, that exceed the limits of the securing arrangements on container ships leading to stack collapses. However, the resulting excessive and violent roll motions can also cause structural damage and machinery failure, as well as a reduction in stability.

The phenomenon of parametrically-excited roll motion or parametric roll was first identified over half a century ago, but was initially only considered to be of concern for smaller ships with marginal stability in following seas. However, its emergence as a particular issue of concern for the container sector came when the Post-Panamax container ship *APL CHINA* sustained significant container loss and damage in heavy weather in 1998[4]. Analysis indicated that the incident had most likely been triggered by a series of extreme parametric rolls while the ship was in head seas.

Further incidents and research have confirmed that the trend towards increasingly large, fine-bodied container ships with high deck capacities has increased the likelihood of parametric roll affecting these ships[5].

Figure 1 Illustration of wavelength similar to ship's length
Source: Marine Accident Investigation Branch (MAIB) report No. 2/2020,
© Crown copyright, 2020

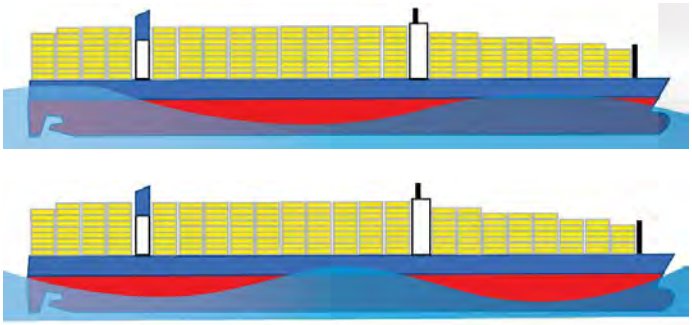
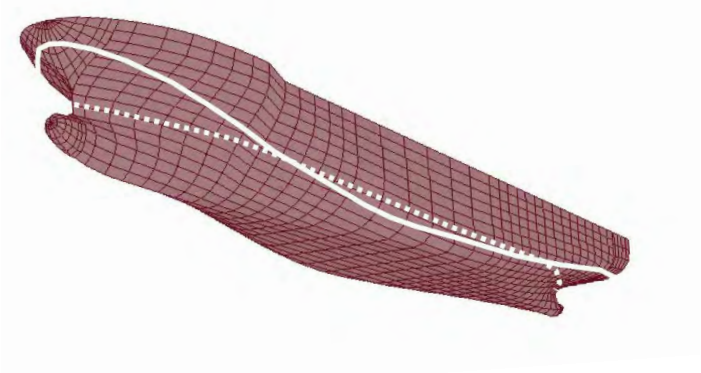


Figure 2 Waterplane area profile in trough (solid) compared to calm water (dotted)
Source: ABS[8]



FOOTNOTES
[1]These include the recently launched 'TopTier' Joint Industry Project being conducted by a consortium led by MARIN: **ow.ly/honA30rLGH3**
[2]Surf-riding occurs when a ship situated on the steep forward part of a high wave in following or quartering seas is accelerated to 'ride' on the wave. This can lead to a sudden change of heading and an unexpected large heeling referred to as broaching.
[3]Synchronous rolling describes the rolling motion induced when the wave encounter period approaches or coincides with the ship's natural roll period. In following and quartering seas this may happen when the transverse stability of the ship is marginal therefore increasing the natural roll period.
[4]France, W.N., Levadou, M., Treakle, T.W., Paulling, J.R., Michel, R.K. and Moore, C. (2003) An investigation of head-sea para-metric rolling and its influence on container lashing systems, Marine Technology 40, pp. 1-19.

Parametric roll results from a periodic change in the ship's stability that occurs when the wave crests and troughs associated with longitudinal (head or following seas) or near-longitudinal waves pass along the hull[6]. A ship's initial intact stability, quantified by its metacentric height (GM), provides the restoring moment to dampen any rolling motion, and is a function of the ship's waterplane area[7]. This constantly changes if the ship is operating in waves as opposed to calm water. If the waves are high and have a similar wavelength to the ship's length **(Figure 1)**, this oscillatory change in stability is exacerbated, in particular for a large modern container ship, given its pronounced bow flare and sterns and wall-sided midship sections. If the ship's midship is in a trough, the average waterplane is significantly greater than in calm water **(Figure 2)**, as the flared bow and stern are more deeply immersed, increasing the GM. However, when the crest is located amidships, the waterplane area is less at the bow and stern **(Figure 3)** and GM is therefore reduced.

The IMO Circular MSC.1/Circ. 1228[9] states that parametric roll may occur when the ship's roll period (T_R) is approximately equal to or half of the period of encounter (T_E) with the waves. In such situations if the roll damping of the ship is low, the fluctuation in GM can therefore result in the roll motions progressively increasing and growing as a result of parametric resonance **(Figure 4)**.

The circular also notes that in following or quartering seas, the stability variation is solely affected by the waves passing along the vessel. However in head or bow seas, frequent heavy heaving and/or pitching may contribute to the size of the stability variation, due to the periodical immersion and emersion of the stern and bow. Therefore, this may lead to severe parametric roll motions even with small wave-induced stability variations.

PARAMETRIC ROLLING – MITIGATIONS

The tendency for parametric rolling to develop rapidly and dramatically in adverse conditions can make it difficult for the bridge team to respond effectively. However, there are various preventive risk controls that can be implemented to mitigate against its occurrence:

• Perhaps the most effective means of reducing the likelihood of parametric roll is by detailed consideration at the ship design stage to optimise the hull form. Classification Societies provide guidance on these considerations[8].

• As noted previously, IMO Circular MSC.1/Circ. 1228 provides generic guidance to masters to help prevent various dynamic phenomena which, although not ship-specific, should be referred to.

• Any available parametric avoidance tools and/or onboard guidance should be fully used to support onboard decision-making.

• If the conditions for parametric roll are encountered, appropriate alterations to course, speed, and if practicable, ballasting, should be considered to lessen the ship's motions. It should be noted that:

  – the conditions for parametric roll will be specific to each situation;

  – any such alteration needs to consider the possibility of other undesirable phenomena or motions, such as slamming, occurring, as well as ensuring compliance with other requirements, such as stability criteria;

  – reducing the ship's speed and changing the heading into the seas can exacerbate the rolling.

• The bridge team should always regularly observe and record the actual wave conditions.

• The principles of good seamanship should be applied by regularly checking and tightening the container lashings, in particular if heavy weather is expected.

• Ensure bridge team members are aware of the principles of dynamic phenomena and the specific characteristics of their ship through awareness and training, including the use of onboard decision support systems.

CONCLUSION

Although parametric roll is fortunately a rare occurrence, its consequences can be devastating. Risk control options exist that can reduce its likelihood, including increased situational awareness and taking effective timely actions based on all available information.

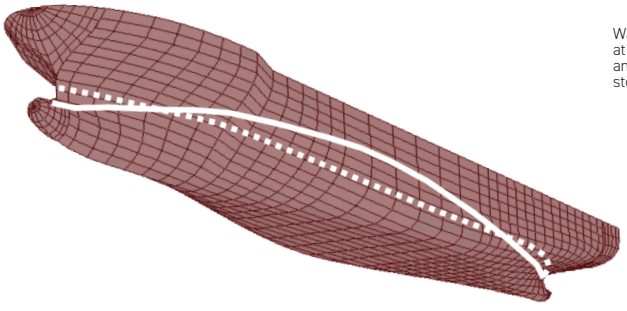


Figure 3 Waterplane area profile in crest (solid) compared to calm water (dotted)
Source: ABS[8]

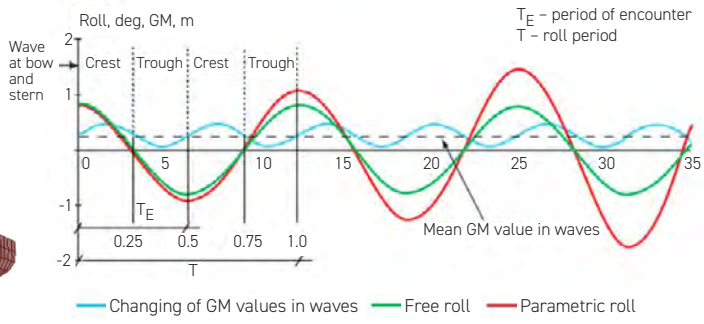


Figure 4 Illustration of parametric roll
Source: Marine Accident Investigation Branch (MAIB) report No. 2/2020, © Crown copyright, 2020

[5]International Towing Tank Conference (ITTC) (2017). ITTC – Recommended Procedures and Guidelines – Predicting the Occurrence and Magnitude of Parametric Rolling.
[6]Hashimoto, H., Umeda, N. Matsuda, A. and Nakamura, S. (2006) Experimental and numerical studies on parametric roll of a post-panamax container ship in irregular waves, Proc. STAB 2006, pp. 181-190.
[7]This is the horizontal area of the hull where the surface of the sea intersects it.
[8]American Bureau of Shipping (ABS) (2019). Assessment of Parametric Roll Resonance in the Design of Container Carriers.
[9]IMO (2007) Revised Guidance to the Master for Avoiding Dangerous Situations in Adverse Weather and Sea Conditions, Circular MSC.1/Circ. 1228.

CLAIMS AND LEGAL

THE ENGLISH SUPREME COURT LOOKS AT THE COLLISION RULES

THE '*EVER SMART*' AND '*ALEXANDRA 1*' COLLISION (EVERGREEN MARINE (UK) LIMITED V NAUTICAL CHALLENGE LIMITED [2021] UKSC 6): THE ENGLISH SUPREME COURT PROVIDES CLARITY ON HOW THE COLLISION REGULATIONS (COLREGS) SHOULD BE CONSTRUED.

The first collision case to reach the Supreme Court for almost 50 years is of considerable importance both for the application of COLREGS in general and, in particular, how the crossing rules (Rule 15) and narrow channel rules (Rule 9) apply at the mouth of a narrow channel.

BACKGROUND

The collision took place at the pilot boarding area at the mouth of the channel to Jebel Ali in February 2015. A container ship, *EVER SMART*, was heading outbound of the channel when it collided with a VLCC, *ALEXANDRA 1*, which had been drifting whilst waiting for a pilot near the channel entrance. At the time of the collision the *ALEXANDRA 1* had not yet turned to starboard to enter the channel.

At first instance *EVER SMART'S* lawyers argued that the crossing rules applied and *ALEXANDRA 1*, as the crossing vessel, had to give way to the *EVER SMART*. Lawyers for *ALEXANDRA 1* disputed this, arguing that (i) the crossing rules did not apply in the vicinity of the entrance to a channel and the applicable rules were the narrow channel rules or Rule 2 (good seamanship) and (ii) the crossing rules only apply to vessels on a steady course and, because the *ALEXANDRA 1* was drifting, it could not have been considered to be on a steady course.

The first instance court agreed with *ALEXANDRA 1's* lawyers, with the consequence that the crossing rules were not engaged and the *ALEXANDRA 1* was, therefore, not obliged to keep out of the way of the E*VER SMART*. On this basis, the court apportioned liability 80/20 against *EVER SMART*. The Court of Appeal upheld the decision.

Owners of the *EVER SMART* appealed to the Supreme Court, arguing that the lower courts' interpretation of COLREGS was wrong in that it did not give sufficient weight to the importance of the crossing rules.

QUESTIONS FOR DETERMINATION BY THE SUPREME COURT

The first question that the court was asked to consider was whether the crossing rules were inapplicable or should be disapplied in a situation where an outbound vessel navigates within a narrow channel and encounters another vessel on a crossing course navigating towards that channel in preparation for entering it.

The second question was whether there was a requirement for the putative give-way vessel to be on a steady course before the crossing rules can be engaged.

The Supreme Court considered the second question first because it concerned the engagement of the crossing rules. It found that neither the give-way vessel (*ALEXANDRA 1*) nor the stand-on vessel (*EVER SMART*) had to be on a steady course in order for the crossing rules to apply. The court said that:

'... if two vessels, both moving over the ground, are crossing so as to involve risk of collision, the engagement of the crossing rules is not dependent upon the give-way vessel being on a steady course. If it is reasonably apparent to those navigating the two vessels that they are approaching each other on a steady bearing (over time) which is other than head-on, then they are indeed both crossing, and crossing so as to involve a risk of collision, even if the give-way vessel is on an erratic course. In such a case, unless the overtaking rule applies, the crossing rules will apply.'

With the application of the crossing rule, the *ALEXANDRA 1*, as the give-way vessel, was, therefore, required to keep out of the way of the *EVER SMART*.

The Supreme Court then addressed the first question by analysing the circumstances in which the crossing rules and narrow channel rules would apply.

The court identified three broad groups of vessels:
'Group 1 are vessels which are approaching the entrance of the channel, heading across it, on a route between start and finishing points unconnected with the narrow channel. They are approaching the entrance of the channel, but not intending or preparing to enter it at all. Group 2 are vessels which are intending to enter, and on their final approach to the entrance, adjust their course to arrive at their starboard side of it. Group 3 are approaching vessels which are also intending and preparing to enter, but are waiting to enter rather than entering'.

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The court found that the crossing rules would apply to the vessels in Group 1 and Group 3, but would not apply to those in Group 2. The present case came within Group 3 because the *ALEXANDRA 1* had not yet shaped to enter the narrow channel.

The Supreme Court emphasised the importance of the crossing rules and stated that:

'Where an outbound vessel in a narrow channel is crossing with an approaching vessel so as to involve a risk of collision, the crossing rules are not overridden by the narrow channel rules merely because the approaching vessel is intending and preparing to enter the narrow channel. The crossing rules are only overridden if and when the approaching vessel is shaping to enter, adjusting her course so as to reach the entrance on her starboard side of it, on her final approach.'

Based on their consideration of the two questions, the Supreme Court overturned the lower courts' decisions. The court of first instance will now re-determine the apportionment of liability on the basis that the crossing rules applied.

CONCLUSION

The Supreme Court's ruling provides some practical guidance on the interaction between the crossing rules and the narrow channel rules where they appear to conflict. It also emphasises the important international character of COLREGS and their application to 'mariners of all nationalities, of all types (professional and amateur), in a wide range of vessels and in worldwide waters'. In addition, the Court provides useful interpretations of the terms 'heading', 'course' and 'bearing' which are not defined in COLREGS.

CAN YOU RESCIND A CHARTERPARTY FOR A BREACH OF A SPEED AND CONSUMPTION CLAUSE?

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SK Shipping Europe PLC v Capital VLCC 3 Corp & Capital Maritime and Trading Corp (C Challenger) [2020] EWHC 3448

THE ENGLISH HIGH COURT HAS RECENTLY CONSIDERED THE ISSUES OF WHETHER CHARTERERS ARE ENTITLED TO RESCIND A CHARTERPARTY IF THEY RELIED ON DATA CIRCULATED BY SHIPOWNERS TO THE MARKET LATER FOUND TO BE INACCURATE AND THE EFFECT OF CHARTERERS RESERVING RIGHTS WHILE CONTINUING TO PERFORM THE CHARTERPARTY.

PRE-CONTRACTUAL REPRESENTATIONS

The dispute arose from a time chartered ship's over-consumption of bunkers during the charter period. Charterers purported to terminate or rescind the charterparty (i.e. treat the charterparty as though it had never been made) on the basis that, when offering the ship to the market, owners had supplied inaccurate historic data relating to the ship's consumption which charterers had relied upon when entering into the charterparty.

Although the court decided that owners had not acted fraudulently in circulating the inaccurate data, it found that the disclosure of the data amounted to a misrepresentation that it was based on actual consumption although owners had no reason to believe that the data was wrong. In theory, this may have given charterers the right to rescind the charterparty.

It is recommended that whenever vessel information is circulated to potential counterparties, the data is first checked thoroughly and adjusted (if necessary) to ensure that it is accurate to the shipowner's best knowledge. It is also recommended that records are kept of the checks that are made in this regard.

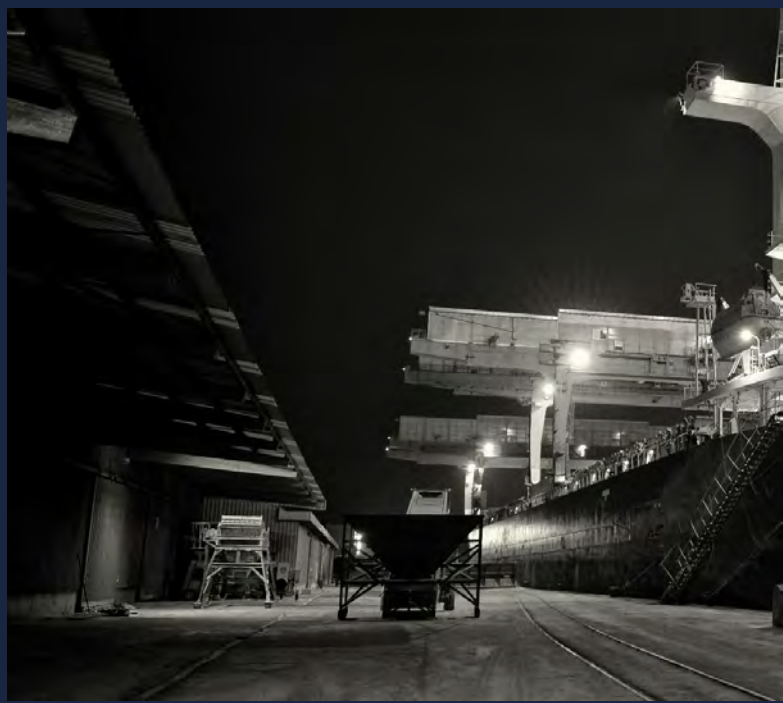
RESERVATION OF RIGHTS WHILE CONTINUING TO PERFORM CHARTERPARTY

Charterers had first raised the issue of a potential misrepresentation with owners in March 2017. However, it was not until October 2017 that charterers purported to rescind the charterparty. During the intervening period charterers continued to employ the ship, including fixing sub-charters, while reserving their rights.

The Court held that these actions were not consistent with a reservation of rights to set aside the charterparty. In spite of charterers' consistent reservation of rights, the Court ruled that by their actions charterers had affirmed the charterparty and, therefore, were not entitled to terminate it due to owners' alleged breach. This is because charterers had continued to employ the ship despite their knowledge of the ship's over-consumption.

In the event of a breach of charter, the innocent party usually has a choice between affirming or terminating the contract. At times, the innocent party will continue to perform its obligations under the charter under an express reservation of rights. The Court's decision shows that this course of action should be considered very carefully. Courts will look at the wording of the reservation of rights as well as the conduct of the innocent party. If the innocent party's conduct is consistent with an intention to keep the charterparty alive, the court may find that the innocent party has elected to affirm the contract thereby losing its rights to terminate the charter for the alleged breach. Ultimately, this will be a question of fact to be considered on a case by case basis.

In light of this decision, the utility of an express reservation of rights following a breach of charter is questionable. The wording of any such reservation should be drafted very carefully. The bigger question is whether the innocent party's conduct can be consistent with a right to terminate while also being compatible with the continuation of the charterparty. It is recommended to seek legal advice when faced with such a situation.



CAN RANSOM PAYMENTS BE RECOVERED AS A GENERAL AVERAGE EXPENSE?

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RULES OF INCORPORATION AND JOINT INSURANCE FUNDS: OWNERS ARE ENTITLED TO CLAIM A GA CONTRIBUTION FROM CARGO OWNERS IN RESPECT OF RANSOM PAYMENTS.

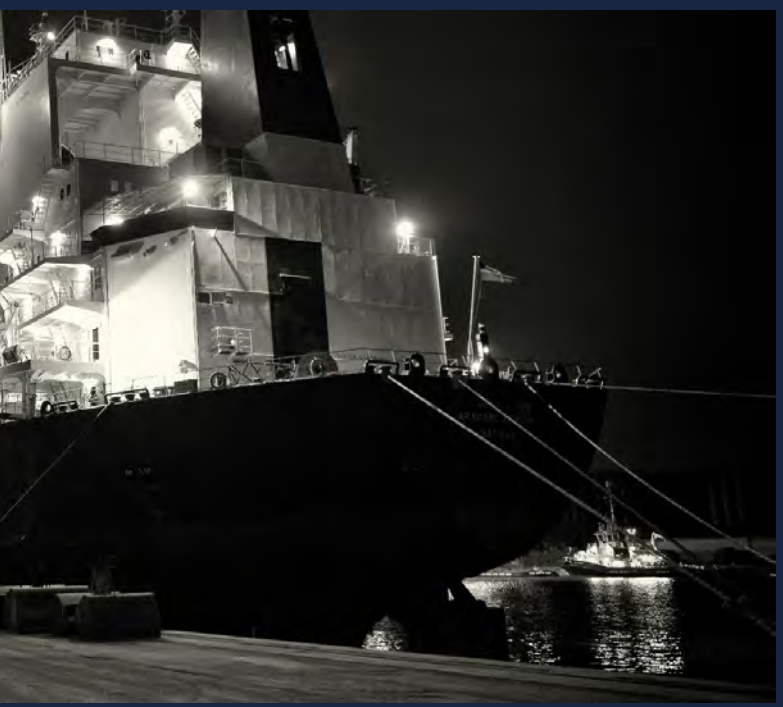
Herculito Maritime Limited and others v Gunvor International BV and others (MV POLAR) [2020] EWHC 3318 (Comm)

In an appeal against an arbitration award, the English High Court considered whether owners were precluded from recovering a General Average (GA) contribution from cargo interests in respect of a ransom payment made to pirates because of provisions in the charterparty under which charterers were liable for paying K&R and H&M war risks insurance premiums.

BACKGROUND

In October 2010, while sailing from St Petersburg to Singapore with a cargo of fuel oil, the *MV POLAR* was seized by Somali pirates in the Gulf of Aden area. The ship was released nearly 11 months later following a ransom payment to the pirates of USD7.7 million. This sum was covered by a combination of payments under owners' K&R and H&M war risks cover.

GA was declared and the ship's owners brought a claim in arbitration under the bills of lading against the cargo owners for GA contributions in respect of the ransom payment. The arbitration tribunal decided that cargo owners were not liable to pay GA in respect of the ransom payment. They held that, on a true construction of the bills of lading, which incorporated the terms of the relevant charterparty, owners' only remedy was to recover the ransom payment under their K&R and H&M war risks insurance, the premiums for which were paid by charterers in accordance with the charterparty.



THE LEGAL ISSUES

Owners appealed against the tribunal's award on two points of law.

The first point was to consider whether the terms of a charterparty which allocated responsibility for the payment of H&M war risks and K&R premiums between owners and charterers were relevant to the carriage of the ship's cargo in the context of a bill of lading. The court said 'no'. Although the bills of lading incorporated the charterparty, a term in the charterparty stating that the charterers were liable for insurance premiums could not be read as imposing a liability on the bill of lading holders for payment of those premiums. The second point of law that the court considered was whether an agreement between an owner and bill of lading holder concerning the allocation of responsibility for the payment of H&M war risks and K&R insurance premiums creates an exclusive insurance fund that precludes owners from recovering GA contributions from cargo interests in respect of any losses suffered as a result of perils covered by the insurance policies. Again, the court said that the answer to this question was 'no'. The court held that a joint insurance fund had been agreed between owners and charterers, such that owners were precluded from seeking to recover that loss by way of a GA contribution from charterers. However, as the bill of lading holders had not agreed to pay the insurance premiums, it could not be said that a joint insurance fund had been agreed which prevented owners from claiming a GA contribution in respect of ransom payments from cargo interests.

Accordingly, owners' appeal was successful.

COMMENT

This is the first time that the English court has been asked to consider the incorporation into a bill of lading of charterparty war risks clauses and other similar terms, as well as the effect of those provisions on GA contribution claims against bills of lading holders. Although owners were, ultimately, successful, the case serves as a reminder to owners to consider carefully the allocation of piracy risks when drafting bill of lading contracts.

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