

Opinion: Eliminating the Risk of Container-Stack Collapses – Solutions and Unseaworthiness



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THE WORLD Shipping Council (WSC) claim that its member companies operate about three quarters of the world's global containership capacity. In their *Containers Lost at Sea 2020 – Update*, they reported that the 3-year, 2017-2019, average annual loss of containers overboard was 779 units – a number adjusted upwards to include non-member companies. (The WSC have maintained such statistics since 2011). However, while the statistics end in 2019, the container vessel *One Apus* lost 1816 containers overboard in November 2020 and the *Maersk Essen* lost about 750 containers in January 2021.

When containers fall off a vessel, those that do not sink immediately, pose a risk to small craft such as fishing vessels, whose hulls would not withstand the force of contact with a container's side rails or worse, its corner castings. And of course, contact with a recreational or charter boat could be tragic. The risks associated with containers washing ashore and

damaging coastal works including jetties; their contents, including dangerous goods, strewn along coastlines and tourist beaches; their effects on the food chain, marine fauna and flora – are a discussion for another day. Comfort can be drawn from the fact that no crew injuries from flying projectiles and dangerous liquids ejected from collapsed and/or damaged containers, have been reported – yet.

The principal factors contributing to container stack collapses are two known defects: first, containers loaded contrary to the Container Securing Manual (CSM), such as heavy containers over lighter ones; and container stacks exceeding permissible weight limits; secondly, container stacks not secured as block units. While investigative reports include the defect associated with the CSM, the writer has not seen, (but acknowledges there could be), reports that refer to container stacks not being secured as block units. (Other contributory factors such as loose and/or degraded container securings and the commercial pressures on masters to navigate through the storm rather than around it to maintain schedules, could be overcome by shipowners exercising due diligence). But, while ever the two known defects exist, the risk of container stack collapses remain.

This article proposes solutions to eliminate the risk of container stack collapses first, by ensuring that container loading plans comply with the CSM, through computerised loading programs with fail-safe mechanisms; secondly, by making the Designated Person Ashore (DPA) responsible for overseeing container loading plans; and thirdly, by ensuring that container stacks are secured as block units. The article also proposes research for a safer container securing system; considers the seaworthiness of vessels at the commencement of their voyages with the two known defects; and the issue of cost to rectify the defects.

CONTAINERS LOADED IN COMPLIANCE WITH THE CSM

It is accepted practice that container loading plans are prepared by shore planners using the computerised loading programs and CSMs, provided by shipowners. This arrangement has been adopted by shipowners because, apparently, neither the master nor the chief officer, has the time or the capability to prepare such plans. Shipowners know that loading plans often do not comply with the CSM resulting in containers being loaded onto vessels in breach of the CSM. Shipowners also know that stevedores disregard loading plans, such as when a container next in the loading sequence, cannot be located. To avoid a possible delay to the sailing schedule, stevedores will load the next available container, regardless of

consequences. The *GARD Guidance on Freight Containers 2016*/Jeroen de Haas explains how shore planners and stevedores, without knowledge of vessel stability, breach the CSM: *As previously indicated, the CSM is valid only for certain GM values, which is problematic if the ship operates at a higher GM value. The following are typical examples which describe the problems and explain the need for lashing software*

The same CSM shows that in a certain bay on deck the containers can be stacked six tiers high, and that the tier weight from the base to the top is: 30 t, 20 t, 20 t, 15 t, 10 t, 7 t. The maximum stack weight is then 102 tonnes. However, containers are never loaded exactly as prescribed by the CSM. If, for example, the container in the bottom tier weighs 21 tonnes instead of 30 tonnes, the first instinctive reaction may be that the forces will be less than the example given in the CSM, and the stowage would therefore be safe. However, the opposite is the case as less weight in the bottom tier will create higher forces as the centre of gravity of the stack moves upwards.

CSM breaches are not restricted to 'shore' planners: *Annabella* MAIB Report No 21/2007: [1.4.1] *The stowage plan for the cargo to be loaded onto Annabella was planned by the charterer, Unifeeder, at its offices in Aarhus, Denmark. The company had 41 vessels on charter at the time of the accident and employed 4 full-time and 1 part-time planners in its operations department who prepared the cargo stowage plans for all of these vessels. The planners were aware of Annabella's stowage capabilities and also held some details of her stability. However, they ultimately relied on the vessel's staff to alert them to any errors in the stowage plan, and expected the chief officer to critically check every aspect of the stowage plan before the vessel began loading. (emphasis added)*

[1.4.2] *After the accident, a simulation of the collapsed stack load was carried out and it was found that the planning software had not been programmed to recognise 30 foot containers. It transpired that when this size was entered into the programme, it was automatically changed to 40 foot without any alert being given to the operator.*

Shipowners know that Ch VI of the SOLAS Convention places ultimate responsibility on masters, for the safe loading and securing of cargo/containers; and that loading plans are provided to masters perhaps a day, but sometimes hours, before loading commences. This prevents masters, already overwhelmed by officialese, from checking loading plans' compliance with CSMs; and only a brave master would demand more than a few amendments to a non-complying plan due to commercial pressure, self-preservation and delays to schedules. Commercial pressure is described in the *Ever Smart* MAIB Report No 14/2020, para 2.6:

Regardless of the logistical and commercial challenges faced by the container shipping industry, the guidance provided in a ship's CSM and the warnings given by its loading computer should not be

ignored. Ships' masters and C/Os might be able to identify and rectify isolated cargo stowage plan issues, but it is impractical to expect them to address large scale problems such as those identified in this report due to the potential commercial impact such interventions would have. The onus should be on the shore planners to deliver compliant and safe stowage plans.

The extract's last sentence about the onus for compliant and safe stowage plans to be placed on the shore planners, is contrary to masters' obligations under SOLAS.

To ensure that shore planners and stevedores comply with the CSM, the computerised loading programs, as earlier noted, should be designed with fail-safe mechanisms that, *inter alia*, reject a container allocated to a slot contrary to the CSM. A fail-safe mechanism is a basic feature of computer programs, achievable without sophisticated computer skills. Such a mechanism would ensure that every loading plan, and every container loaded onto a vessel, complied with the CSM, thereby ensuring masters' and shipowners' compliance with their obligations under SOLAS and the Hague/Hague-Visby rules, respectively.

The computerised loading programs of container cranes should have similar fail-safe mechanisms to ensure every container lifted for loading onto a vessel, complied with the loading plan. The fail-safe mechanism would work as follows: the crane would lift a container identified by the computerised loading program as being 10 tonnes, but the crane's weight display would show its accurate weight as, let us say, 12 tonnes. This would cause the crane to cease lifting and emit an audio-visual alarm (relayed to the shipowner's DPA for follow-up action); the crane operator would lower the container to the ground.

CONTAINER WEIGHTS AS DECLARED

The declared weight of a container is a sub-set of the computerised loading program because the CSM requires accurate container weights. Receiving ports and/or stevedores could ascertain the actual weight of a container first, when it is lifted off the truck or rail wagon in the port; secondly, during the container's transfer to the stacking area; and finally, during the container's transfer to the crane access area. Each time the container is handled, the equipment, consistent with its design and the work, health and safety (WHS) regime, should display the container's actual weight, enabling detection of a container with mis-declared weight. The fact that containers with mis-declared weights are being loaded onto vessels is proof that either, ports and/or stevedores are practising wilful blindness to mis-declared weights or the handling equipment's weight function is disabled. Shipowners could enforce detection of containers with mis-declared weights by insisting on handling

equipment operating as designed; by requiring ports and/or stevedores to provide DPAs with certification from equipment safety auditors confirming operability of the weight function; and requiring ports to enforce WHS penalties against shippers of offending containers. A measure that would concentrate the minds of shippers of offending containers, would be their international black-listing after one strike, because safety should not require three!

DPA TO BE RESPONSIBLE FOR OVERSIGHTING LOADING PLANS

The DPA was recommended by the UK's MS Notice No 1188, (July 1986):

“Every company operating ships should designate a person ashore with responsibility for monitoring the technical and safety aspects of the operation of its ships and for providing appropriate shore-based back-up.”

The Hon Mr Justice Sheen, referred to this person in his Investigative Report (para 14.2) into the *Herald of Free Enterprise* disaster in 1987:

This is very sound advice. It is advice which ought to have been unnecessary. A well-run ship-owning company should have been organised in that manner before receiving the Notice.

The IMO requires the DPA to have, *inter alia*, the experience to:

Gather and analyse data from hazardous occurrences, hazardous situations, near misses, incidents and accidents and apply the lessons learnt to improve the safety management system within the Company and its ships.

The required experience indicates that a DPAs responsibility is active rather than passive, because they are required to analyse accidents and apply the lessons or recommendations to their company's ships. DPAs should be made responsible for checking container loading plans' compliance with the CSM, as per of shore-based support to the master. A computerised loading program with fail-safe mechanisms, would facilitate such compliance. The DPA would, as earlier noted, also respond to alerts from container cranes lifting containers with mis-declared weights.

CONTAINER STACKS TO BE SECURED AS A BLOCK UNIT

Securing a container stack as a block unit requires lashing bars with turnbuckles, fitted manually between the bases of each tier of containers and lashing eyes or plates on the deck below. With the existing container securing system, only containers stacked three or four high can be secured as a block unit with lashing bars, because the weight of the lashing

bars can be handled safely by stevedores. Containers stacked above the 4th tier cannot be secured as block units because the length and weight of the lashing bars required to secure them as block units, are unsafe for handling by stevedores. Because containers stacked above the 4th tier cannot be secured as block units, the container stacks become susceptible to collapse during heavy weather. This means that the existing container securing system is defective. Every shipowner knows that the existing defective container securing system is present on their vessels before, and at the commencement of their voyages. Shipowners who claim ignorance of this defect, leave themselves open to criticism for two reasons: their internal investigation into container stack collapses either on their own, or their competitors' vessels, if conducted with due diligence, would have readily identified this defect; secondly, it would demonstrate wilful blindness according to the great Lord Denning MR, in *The Eurysthenes* [1977] QB 49, 68:

"If a man suspicious of the truth, turns a blind eye to it, and refrains from enquiry — so that he should not know it for certain — then he is to be regarded as knowing the truth. The 'turning a blind eye' is far more blameworthy than mere negligence."

And Lord Roskill LJ in the same case (76):

"If the facts amounting to unseaworthiness are there staring the assured in the face so that he must, had he thought of it, have realised their implication upon the unseaworthiness of his ship, he cannot escape from being held privy to that unseaworthiness by blindly or blandly ignoring those facts or by refraining from asking relevant questions regarding them in the hope that by his lack of inquiry he will not know for certain that which any inquiry must have made plain beyond possibility of doubt."

Container stacks above the 4th tier could be secured as block units by using lashing bars long enough to reach between the bases of the highest tier of containers and the deck below, in the manner described: the longer and heavier lashing bars would be stowed on deck vertically, in specially designed storage bins, from which they would be removed by a specially designed device, suspended from the container crane and operated by a stevedore from deck. The device would, amongst other things, have a clamp capable of swivelling about 45° either side of the vertical; a sensor for alignment and an in-built mechanism for self-raising/ -lowering over a distance of about 300 mm. The clamp would grip the lashing bar at a pre-designed location below its swivel-head and lift it clear of the bin (with a stevedore holding its lower end to control its swing). The (device) operator would convey the lashing bar towards the relevant container corner casting, and the device's sensor would detect and align the swivel-head with the casting, self-raising/lowering as appropriate. Once

aligned, the operator would move the device towards the casting, enabling the swivel-head to engage with the casting. The device would then self-lower the bar to complete the connection. The clamp would continue to grip the bar until the stevedores had secured its lower end to the deck below, in the usual manner. Thereafter, the operator would release the clamp and convey the device to the next lashing bar.

Removal of a lashing bar would require the clamp to grip the angled lashing bar while the stevedore released its deck securing, and the bar swung vertically from the corner casting. The device would then self-raise until it was aligned and ready to be removed from the corner casting by the operator, who would then convey it to the storage bin.

RESEARCH INTO A SAFER CONTAINER SECURING SYSTEM

Shipowners, like other business owners, allocate funding readily towards building ships with greater container capacity, in order to increase profits – expected of respectable businesses. (Unfortunately, some shipowners may engage in anti-competitive conduct to increase profits, which has resulted in the establishment of a working group comprising the Australian Competition & Consumer Commission, US Department of Justice and Federal Bureau of Investigation, Canadian Competition Bureau, NZ Commerce Commission and UK Competition and Markets Authority, to consider whether such conduct is prevalent). While expenditure towards increasing profits is good business practice, it is well known that every dollar allocated to safety is provided grudgingly, because safety affects the bottom line and shipowners refuse to grasp the principle of a return on safety. Ironically, since Covid-19, shipowners have experienced profit bonanzas as noted by Drewry on 23 December 2021:

(DMFR), the investment research arm of global shipping consultancy Drewry, remains bullish about continued high stock prices and rising profitability in the booming container carrier sector. The strong performance in the global container shipping sector has generated very handsome spill-over benefits for stock investors. The returns since the start of 2020 have been astronomical. (emphasis added) Asian liner operators were the top performers; with Yang Ming up by 1,583% (as of mid-December 2021), followed by Evergreen Marine's gain of 987% and Wan Hai's 976%. HMM generated returns of 621%. More modest growth was seen in Europe, where Hapag-Lloyd shares increased by 192% and Maersk's by 123%. Clearly, the pandemic and ensuing supply chain crisis that supercharged carrier profits has been the primary driver for the share price bonanza.

The astronomical returns and supercharged carrier profits mean that shipowners have a golden opportunity to fund research into designing a safer container securing system, while still declaring impressive dividends. Shippers, cargo owners, ports and consumers have a right to expect that shipowners, armed with bulging coffers, will act as responsible partners in the supply chain, working to eliminate container stack collapses; preventing risk of injury to crew and reducing the cost of goods to consumers. The consumers bear the heaviest burden with prices marked up by the cargo owners to recoup their triple whammy in losses: paying the deductible/excess; loss of profits and higher premiums at renewal. Cargo insurers also sustain losses because, having reimbursed cargo owners, they often forego recovery of smaller amounts from P&I Clubs because recovery charges make them uneconomical. Shipowners of course, can pass on their losses through higher freight rates.

To eliminate the risk of container stack collapses, shipowners should, as a matter of urgency, appoint a group of experts comprising P&I Clubs, class societies, hull and machinery underwriters, ports, stevedores and manufacturers of containers/lashing equipment. The experts' principal task would be to design a container securing system that secured container stacks as block units, precluding their collapse in heavy weather. The proposed use of heavier and longer lashing bars as earlier described, is to demonstrate the capability of securing container stacks as block units, but importantly, to stimulate ideas towards achieving block units. The experts may decide to replace steel with carbon fibre, (considered to be superior in terms of weight, tensile and shear properties); or use drones to handle lashing bars. They should also consider the feasibility of stowing moveable securing equipment in the ports rather than on vessels, enabling their maintenance and compliance auditing by DPAs. The availability of expertise, construction materials, technologies and artificial intelligence means that shipowners have no excuse to delay designing a safer container securing system. The experts should not rule out a worldwide competition for a safer container securing system, running in parallel with their task.

Governments have been proactive in requiring seafarers to continually improve their skills and knowledge through courses and revalidation of their certificates of competency. Shipowners cannot sit idly by, content with a container securing system that a disinterested observer such as a consumer, would find primitive.

SEAWORTHINESS OF VESSELS AT THE COMMENCEMENT OF THEIR VOYAGES

It is now appropriate to consider a vessel that commences its voyage with the two known defects viz containers loaded contrary to the CSM and with the existing container securing system. Should its container stacks collapse in heavy weather, a court could decide that the vessel was unseaworthy at the commencement of its voyage. The unseaworthiness of such a vessel should be considered in light of the UK Supreme Court's unanimous decision in *Alize 1954 and another (Appellants) v Allianz Elementar Versicherungs AG and others* [2021] UKSC 51, the *CMA CGM Libra*. This vessel was found to be unseaworthy at the commencement of its voyage because its passage plan was defective when the vessel commenced its voyage from Xiamen, China. According to the Court, the unseaworthiness of the *CMA CGM Libra* meant that its owners breached their obligations under the *Hague Rules 1924* [sic], Article 3.1:

The carrier shall be bound before and at the beginning of the voyage to exercise due diligence to make the ship seaworthy, properly man, equip, and supply the ship, make the holds, refrigerating and cool chambers, and all other parts of the ship in which goods are carried, fit and safe for their reception, carriage and preservation.

The following extracts are from the *Conclusion* of the decision at para 145:

(vi) Given the "essential importance" of passage planning for the "safety ... of navigation", applying the prudent owner test, a vessel is likely to be unseaworthy if she begins her voyage without a passage plan or if she does so with a defective passage plan which endangers the safety of the vessel (see paras 124-128).

(x) The carrier is liable for a failure to exercise due diligence by the master and deck officers of his vessel in the preparation of a passage plan for the vessel's voyage. The fact that navigation is the responsibility of the master and involves the exercise by the master and deck officers of their specialist skill and judgment makes no difference (paras 137-139).

The decision is simple: a vessel is unseaworthy at the commencement of the voyage if, at the commencement of the voyage, the vessel's passage plan is defective. The defect in question was the failure to mark, on the passage plan and the working chart – as required by the *Guidelines for Voyage Planning* – the shallow water areas outside the dredged channel. Shortly after the *CMA CGM Libra* dropped its pilot outbound from Xiamen, the master, (for reasons best ignored), navigated the vessel outside the dredged channel, at a speed of about 11 knots for about 3 minutes. Not surprisingly, the vessel grounded in shallow water outside the channel. The master explained that, if the shallow water areas outside the dredged channel had been marked on the working chart, he would not have left the dredged channel – an explanation also best ignored. The fact that the owner had provided

the vessel with the wherewithal to prepare a compliant passage plan, did not absolve the shipowner from the master's actions.

Applying the above decision to a vessel that commenced its voyage with the two known defects, such a vessel could be considered unseaworthy for breaching:

- i. the provisions of Article 3.1 (extracted above; including *Hague-Visby*); and
- ii. the General Principles of the *Code of Safe Practice for Cargo Stowage and Securing* (Code), two of those principles being: (i) Personnel planning and supervising the stowage and securing of cargo should have a sound practical knowledge of the application and content of the Cargo Securing Manual; and (ii) Decisions taken for measures of stowage and securing cargo should be based on the most severe weather conditions which may be expected by experience for the intended voyage. (Interestingly, the Code does not refer to stevedores who are known to ignore the loading plan as earlier described).

Regarding the first principle above: if the shore planners had sound practical knowledge of the application and content of the CSM, and if they had always acted with such knowledge, the loading plans would have always complied with the CSM and fail-safe mechanisms would probably not be necessary. Concerning the second principle: if the vessel had a safe and proper container securing system, then, there would be no container stack collapses when a vessel encountered heavy or severe weather conditions during the voyage.

In any proceeding against a shipowner following container stack collapses, a court could also decide that the shipowner had failed the prudent owner test, articulated by T Carver in *Carver's Carriage by Sea*, and quoted with approval by Channell J, in *McFadden v Blue Star Line* [1905] 1 KB 697, at 706:

A vessel must have that degree of fitness which an ordinary careful and prudent owner would require his vessel to have at the commencement of her voyage having regard to all the probable circumstances of it...Would a prudent owner have required that it (i.e. the defect) should be made good before sending his ship to sea, had he known of it? If he would, the ship was not seaworthy...

The critical factor against the shipowner would be their prior knowledge of the two known defects before and at the commencement of the voyage. The shipowner would probably raise the defence of industry practice in terms of (i) the loading plan being prepared by shore planners for the majority, if not all shipowners; and (ii) the existing container securing system being used by all shipowners.

Courts have been known to disregard industry practices, holding that courts are the ultimate arbiters of what is required by the law. In the US case *The TJ HOOPER* 60 F. 2d 737 (1932), the court was required to consider whether the owner of tugs towing coal-laden barges, should have provided radio receiving sets to the tugs' masters that would have provided early warning of a storm, enabling them to seek shelter and prevent the eventual sinking of both barges. The tug owner followed industry practice that did not require owners to supply radio sets to their tugs; and the law did not mandate such supply. Justice Learned Hand (one of the smartest judges not to sit on the US Supreme Court) delivered judgement for his two fellow judges and rejected this industry practice:

They can have at hand protection against dangers of which they can learn in no other way. Is it then a final answer that the business had not yet generally adopted receiving sets? There are, no doubt, cases where courts seem to make the general practice of the calling the standard of proper diligence; we have indeed given some currency to the notion ourselves. ... Indeed in most cases reasonable prudence is in fact common prudence; but strictly it is never its measure; a whole calling may have unduly lagged in the adoption of new and available devices. It never may set its own tests, however persuasive be its usages. Courts must in the end say what is required; there are precautions so imperative that even their universal disregard will not excuse their omission.

The High Court of Australia, in *Rogers v Whitaker* [1992] HCA 85, delivered a joint judgment by five of the six judges, with the sixth judge delivering a separate but concurring judgment. The court had to consider whether the ophthalmologist, Dr Rogers, before operating on Mrs Whitaker's right eye, ought to have informed her that she could develop sympathetic ophthalmia in her good left eye post operation, resulting in the loss of sight in that eye; and obtained her informed consent (to the operation). He did not so inform her and, post-operation, she lost her sight in her previously good left eye. Dr Rogers relied upon the Bolam principle as his defence in not so advising her:

"The Bolam principle may be formulated as a rule that a doctor is not negligent if he acts in accordance with a practice accepted at the time as proper by a responsible body of medical opinion even though other doctors adopt a different practice. In short, the law imposes the duty of care: but the standard of care is a matter of medical judgment." [7]

Put simply, the principle is: if a doctor follows a practice that is accepted as proper by a responsible body of medical opinion, then, even if the practice results in injury to a patient, the doctor cannot be considered to have been negligent. The Court referred with approval

to the decision of King J, regarding a woman who became pregnant after a failed tubal ligation (*F v. R.* ((26) (1983) 33 SASR 189, 194):

The ultimate question, however, is not whether the defendant's conduct accords with the practices of his profession or some part of it, but whether it conforms to the standard of reasonable care demanded by the law. That is a question for the court and the duty of deciding it cannot be delegated to any profession or group in the community.

In rejecting Dr Rogers' defence (that his failure to advise Mrs Whitaker was consistent with the standard practice of his profession), the Court relied upon King J's remarks in *F v R* viz that it was for the court to decide whether the conduct conformed to the standard of reasonable care demanded by the law; such standard was not the duty of a profession or group in the community.

Returning now to the shipowner whose vessel commenced its voyage with the two known defects, resulting in container stack collapses during heavy weather, a court in 2022, could expect the shipowner to have rectified the two known defects years ago. Failure to have rectified the defects could prompt the court to conclude that the shipowner had displayed a cavalier attitude towards cargo/container safety, treating container losses as inevitable and an inherent cost of operating vessels – a notion with which many would agree.

With containers falling overboard, governments could turn their attention to unseaworthy vessels. The Australian *Navigation Act 2012* ss.109 and 110 creates offences for shipowners and masters respectively, for sending/taking unseaworthy vessels to sea. Fault-based offences, max 10 years; civil penalty, max 6000 penalty units (A\$222/unit).

Turning now to the rectification cost of the two known defects, this cost can only be considered by default, because there is no comparable research available as a guide. From a cost/benefit aspect, the rectification cost could be compared against the costs involved in container stack collapses and container retrieval from coastal waters. The cost of the former would run into the hundreds of millions of US dollars, involving, inter alia: cargo; containers; discharge/reload operations; extended port stays; intermediate ports; delayed schedules; restoration of coastal works and tourist beaches; and container recovery from coastal waters. Such exorbitant costs could not reasonably be used as a guide. Turning to container retrieval costs from Australian coastal waters, the Australian Maritime Safety Authority was reimbursed about A\$18M (US\$13M – *YM Efficiency*) and about A\$22M (US\$16M – *APL England*). Using the lower US\$13M cost as a guide, a reasonable person would agree that the rectification cost would be a fraction of US\$13M. But here's the conundrum: on the one

hand, shipowners appear to be content to incur costs associated with container stack collapses since around 2011; but on the other hand, in their Grounds for Application to Intervene in the matter of the *CMA CGM Libra*, the International Group of P&I Clubs noted that, since the Admiralty Court decision regarding that vessel in March 2019, claims received by shipowners concerning passage planning were estimated at US\$116M:

26. These are matters of real financial importance. It is estimated that the total value of claims concerning passage planning that have been received by member clubs since the decision of the Admiralty Court in this case is in excess of USD 116 million.

The comments below put the issue with passage plans into perspective:

i. When the CMA CGM Libra grounded in May 2011, P&I Clubs should have advised their ship-owning members about the circumstances of the grounding and the need for passage plans to be compliant with the Guidelines for Voyage Planning, before and at the commencement of voyages; shipowners, since 2011, should have required their DPAs to ensure that passage plans were compliant, given the easy availability of electronic charts and nautical publications;

ii. The Admiralty Court's decision was delivered in March 2019, almost eight years after the grounding; if shipowners had followed the advice in (i) above, all passage plans should have been compliant at the commencement of the voyages since 2011.

So, what we have here, is this: shipowners continue to operate their vessels with two known defects, despite having incurred losses in the hundreds of millions of US dollars, since 2011-2012. Their apparent willingness to accept such losses is at odds with their concerns around claims associated with passage planning. Had shipowners conducted risk assessments of their operations in 2011-2012, it would have demonstrated the need for urgent action to eliminate container stack collapses and avoid the resulting losses. Their failure to rectify the two known defects and prevent the ensuing losses, lends credence to the 'notion' that shipowners treat certain losses (or costs), as inherent to operating a vessel. Shipowners could discredit that notion by commencing research to rectify the defects that would eliminate container stack collapses, enhance safety at sea; prevent the risk of crew injury and reduce the burden of container losses on the consumer.