

Missing in action

by Mike Yarwood, *Managing Director Loss Prevention, TT Club*

The vital importance of the container to the efficiency of the global supply is undeniable. The loss of such equipment is becoming an increasing cause for concern, particularly in the current situation where congestion and lengthy transit times from Asia to Europe exacerbate a shortage of containers in the right place at the right time. Let us examine the variety of factors adding to these shortages.

When considering theft in the supply chain, understandably the focus is primarily on cargo losses. Criminals inevitably turn their attention to whatever opportunity is presented. Cases involving misappropriation of shipping containers typically implicate large numbers of units over extended periods, which differentiates them from incidents of cargo theft that often involve single incidents that may more easily evade detection.

It is widely recognised that all actors in the freight supply chain – including operators of containers – need to exercise diligence in relation to their counterparties, particularly when contracting with those who are unknown or there is an apparent change in expected behaviour.

Containers lost to thieves...

Theft of containers (whether for trade or repurposing) has long existed, but as technology to track and trace units has developed, the future use of those stolen boxes has had to be more carefully considered by those behind the crimes. Data technology advances – whether through improving standards or with ‘smart’ containers – mean that there are growing possibilities for a stolen unit to flag up as it is gated into a terminal or as processed through the ship’s booking and stowage systems. The criminals understand this, and often the containers are either neutralised and used for long-term, static storage or are altered to disguise the original identity.

More recent trends have been identified where digital records have been

manipulated. This strategy has proven difficult to identify during the early stages of the fraud. One such method that has been seen involves the release of a container that remains for the system record ‘logically’ in a depot (perhaps stated to be under repair). This affords the bad actor time to relocate the container, neutralise the unit, and cover its disappearance.

More sophisticated frauds have demonstrated the potential for insider involvement. Units are maintained on system records as located in a container depot and noted as a constructive total loss following a fictitious physical damage incident, while physically, they have been ‘gutted out’ and sold to a third party. In both scenarios, it could be several months between the fraud commencing and the issue coming to the attention of the container operator.

TT Club has also seen several instances where large numbers of containers have been stolen by fraudulent actors operating in the supply chain. Using tactics similar to those employed to steal cargo, distressed or bankrupted companies have been used to create bookings for large shipments involving many containers. After the units are collected, they are quickly sold, often in countries where they will be difficult to trace or where law enforcement is weak. The fraudulent agent then disappears, and the bust companies they used to create the booking have no assets to claim against. Online platforms that allow third-party bookings are also highly vulnerable to fraudulent actors, illustrating that it is just as important for container operators to complete due diligence as it is for shippers and cargo owners.

... and at sea

While the volumes of containers lost at sea fluctuate year on year, typically influenced by the more severe of weather conditions, the challenge of reducing the numbers remains.

Understanding the circumstances that lead to a collapse of stow and loss overboard incidents is important to mitigate the risks. In this context, TT has been involved from conception in the **TopTier Joint Industry Project** of the Marine Research Institute Netherlands, which draws together a group of over 40 stakeholders in identifying and resolving the circumstances that lead to such incidents. TT’s own analysis of historic incidents clearly shows that weather is the single most influential factor. Yet, the data demonstrate that this is a far more complex challenge involving a wide range of interconnected operations.

The process starts with the consignor, who typically places a transport order, including making a declaration about the cargo being shipped. Accuracy is, of course, vital – freight type, nature, characteristics, etc. – but in the context of loss overboard, the declared weight or verified gross mass is pivotal. It should also be noted that poor load distribution when packing the shipment will erode safety margins.

Next, at the ship/port interface, the terminal operating system will support appropriate on-board stowage alongside stow planning software influenced by declarations of cargo type and gross mass. Where these systems in essence seek to load heavier containers lower in any given deck stack, TopTier studies identified discrepancies

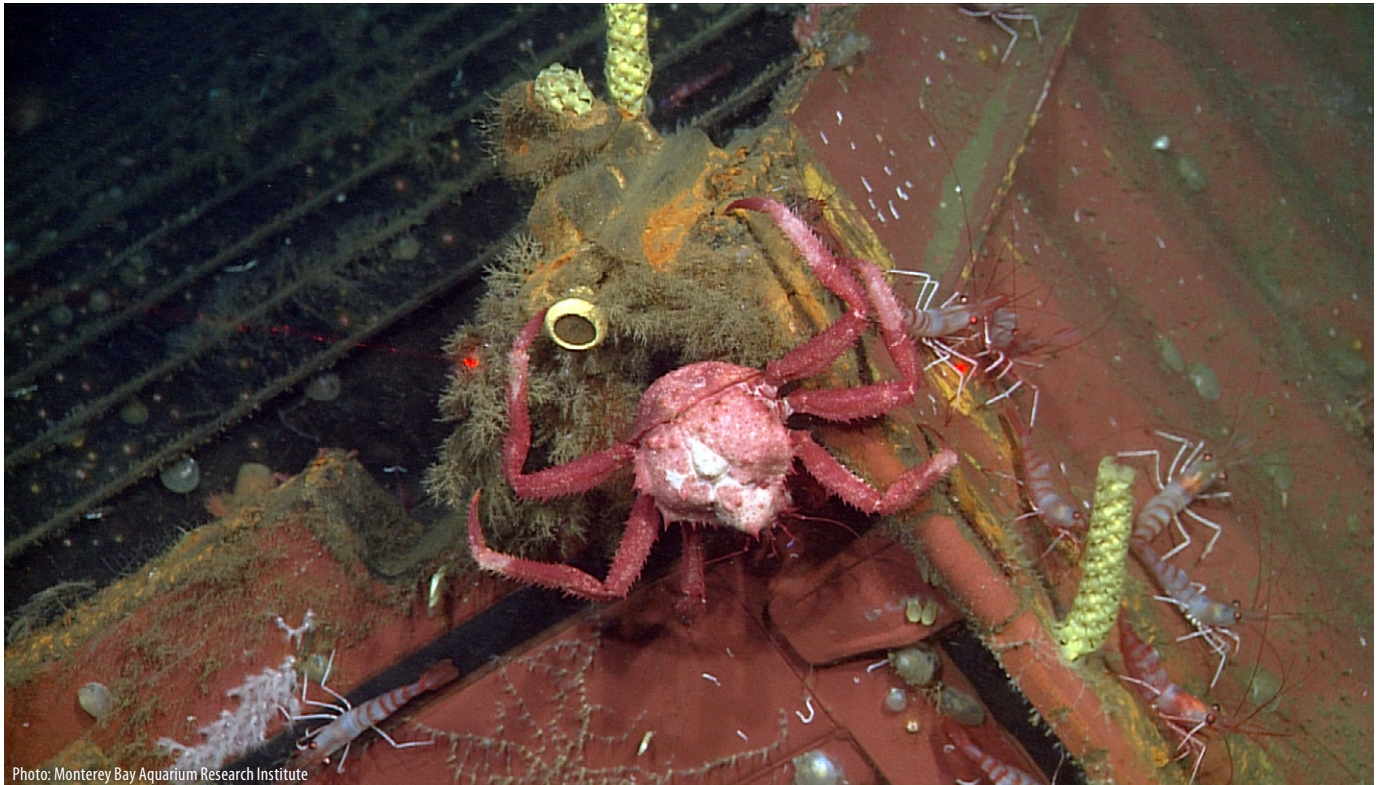


Photo: Monterey Bay Aquarium Research Institute

to 20% between planned stow vs. the actual final stow on board. If representative of all operations, this is itself alarming! This is significant, particularly where a heavy container is erroneously stowed towards the top of a stack. In any adverse sea state, there is an increased risk of stack collapse under the physical forces exerted. Furthermore, if that stack is in the middle of the stow, further collapses in adjacent stacks are more probable.

The loss of a container stack is affected by other aspects beyond simply the wave height, such as sea state and swell from different directions, rapidly changing conditions, and lack of information to the ship's crew about swell that could be predicted ahead of time. For larger container ships, other factors also affect the loss of containers, including excessive metacentric height, whipping, and bottom contact in shallow water.

Moreover, container stack calculations effectively do not take full account of all the constituent components under dynamic force in defining design margins. Lashings have a safe working load at 50% of the maximum break load, but the ISO container tests for stacking and racking set the forces

at the certified strength. Thus, these cannot be used in isolation when considering the container stack forces. Taken together, the developed combined forces of compression and racking, which should be used in ships' planning models, may be higher than the certified strength values of individual containers (this may be particularly pertinent for stacks 10/11 high).

Appreciating all the factors that may erode safety at sea, we look forward to the finalisation of the research by TopTier and the opportunity to continue to be involved in the ensuing debates, particularly at the International Maritime Organization. However, ships will never be able to avoid the impact of heavy seas entirely. Consequently, TT Club, in furtherance of its mission to make the global logistics industry safer, more secure and more sustainable, is currently involved in two other innovation initiatives.

The first, being profiled in the **latest TT Club Innovation in Safety Award**, organised by the International Cargo Handling Coordination Association, is the development by Trendsetter Vulcan Offshore of two complementary digital and engineering solutions to mitigate the

risk of container loss overboard, applying well-established systems from the offshore industry. Their Janus system's monitoring capabilities include both predicting and detecting parametric roll, allowing evasive action to be taken before ship and stack dynamics enter a destructive range. Another innovation is the LR Safetytech Accelerator Cargo Fire and Loss Innovation Initiative. Within a broader technology scope, it's an on-board cargo control system that checks whether freight has been properly loaded, secured, and monitored during transit.

Conventional wisdom remains that heavy storms should be avoided where possible to minimise the risk of container loss. Nevertheless, the deployment of innovative technology can help build greater safety margins, including leveraging data capture to improve understanding and predictions in changing sea conditions.

At multiple points in the supply chain, on land or at sea, there remains a pressing requirement to track, secure and care for the container, not just as an asset but also as a key element in maintaining international supply chains as an integral part of the global economy. ■



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