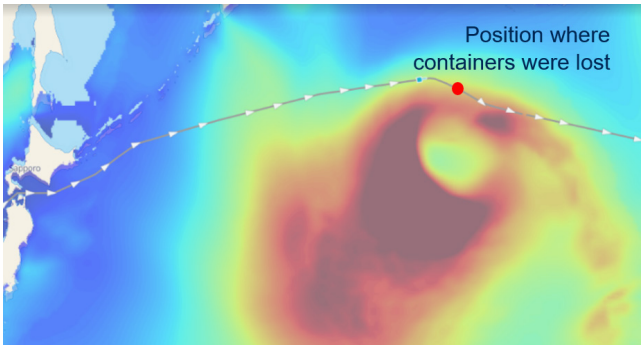
Case study for onboard safety meeting

Container stack collapse in heavy weather

Please read the below story of an incident. Keep our company's standards and procedures in mind while reading to compare with the actions of the crew below as we will discuss the factors which led to the incident occurring.

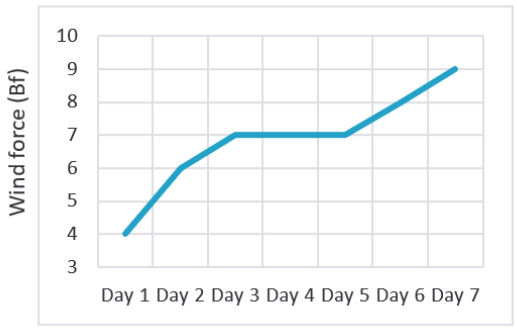
A container vessel with a capacity of 4,000 TEU was en route from Shanghai to Los Angeles. The charterer engaged a weather routing service provider that recommended a route passing through the Tsugaru Kaikyo, a narrow waterway between the Honshu and Hokkaido islands in Japan. The advised path then followed a great circle across the north Pacific to reach Los Angeles. Initial weather projections for this route indicated a maximum wave height of 4-5 meters and a wind force of 6/7. However, the service provider did not ask for information from the vessel regarding weather limiting factors and ship stability.

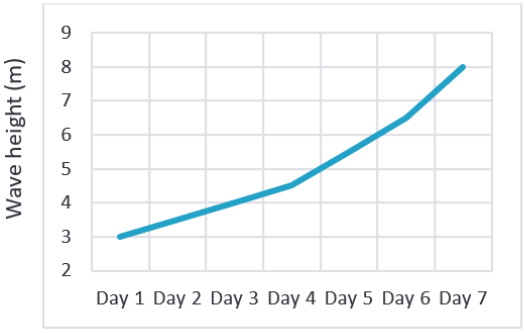


A day after exiting Tsugaru Kaikyo, the weather started to deteriorate. The Master decided to halt all deck work. Subsequently, an updated routing advisory was received, indicating a progressive worsening of the weather conditions over the next 48-72 hours, with anticipated wave heights of 8 meters and winds up to force 9. The vessel was instructed to adjust course and speed as deemed appropriate.

The crew attempted to tighten container lashings but were unable to do so as the vessel was shipping green seas. Over the course of 48 hours, the vessel experienced heavy rolling and pitching. Next morning the crew found collapsed container stacks in several bays. Following the completion of the voyage, the vessel proceeded to dry dock for necessary repairs. Below is a timeline of key events and details of the weather experienced by the vessel in the 7-day period prior to the incident.

Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Exited Tsugaru Kaikyo	*Weather started worsening*	*Deck work ceased, incl. lashing checks*	*Updated routeing advice received*	*Wave ht > 8 m; wind force > 8/9*	*Wave ht > 8 m; wind force > 8/9*	*Stack collapse noticed by crew*





- Several base sockets and lashing eyes were found to be severely corroded. The Master had on two previous occasions expressed concerns to the management about the cargo worthiness of the vessel. Repairs had been deferred to dry dock which was in 4 months' time. Meanwhile the vessel continued trading.
- There were no guidelines in the SMS on the threshold for wind force, wave height and swell height which the vessel could incorporate into its voyage planning. The understanding of these thresholds was very subjective, i.e. there was no common understanding across the company.
- The vessel's weather routeing software showed that had the vessel taken a more southerly route, the weather would have been much more favourable.

Following this incident, the management initiated a project to measure the exposure to adverse weather of all container vessels in the fleet. They discovered that the majority of vessels were regularly facing wind force 8 and above, and wave heights in excess of 6 meters for extended periods of time on transoceanic voyages.

If you have any questions or comments please contact Gard's Loss Prevention team at lp@gard.no

How to improve by lessons learnt

Based on the case, you should now discuss its key aspects and the contributing factors followed by a risk assessment in the context of your vessel and safety management procedures. Consideration should be given to the following areas during this exercise.

Progressively worsening weather – a risk indicator?

- How exposure to progressively worsening weather can lead to a stack collapse.

Weather thresholds

- Are weather thresholds clearly defined in your company's Safety Management Procedures and have these been communicated to charterers and weather routeing service providers.
- Are all navigating officers including the Master aware and have a common understanding of these weather limiting factors, such as maximum wind force and wave height?

Predicting complex rolling phenomena

- Are digital tools provided by the management to assess complex rolling phenomena, such as synchronous and parametric rolling?

Conflicting priorities

- Discuss the conflicting priorities between commercial operators and a Master with regards to weather routeing and how it can affect safety. Also, what kind of support is provided by managers or owners to the crew to manage such commercial conflicts?

Maintenance of lashing and securing arrangements

- Discuss whether there are clearly defined procedures to take container slots with corroded and wasted base sockets and/or lashing eyes out of service until repairs are completed. If the vessel is instructed to continue trading in such circumstances, do the Master and Chief Officer feel empowered to refuse loading in such slots?

See also our article "*High waves, high claims: New study on container loss*"

1 What factors contributed to the incident on board the vessel?

2 Risk Assessment: Could some of the risk factors be identified on board your vessel? What is the likelihood and severity of those risk factors?

3 What measures would you suggest in order to mitigate the risk that could lead to such incidents? Any additional barriers of safety that could be introduced?