



*"Accidents will happen, and the identification of risks, and possible ways to reduce and prevent them, are key priorities for everyone at Gard"*

## Anchoring awareness revisited

Port Authorities today, most likely require lost anchors to be found and removed, thereby resulting in a "wreck removal" case. The more serious and very costly cases occur when dragging anchors leads to collisions, groundings, damage to subsea -cables and -pipelines, or pollution. Ship operators, Masters and crew need to be aware of the risks involved and thoroughly assess the limitations of a vessels' anchoring equipment. Senior Loss Prevention Executive Jarle Fosen recently shared Gard's experience and recommendations at the DNV sponsored webinar co-hosted by Gard and The Swedish Club.

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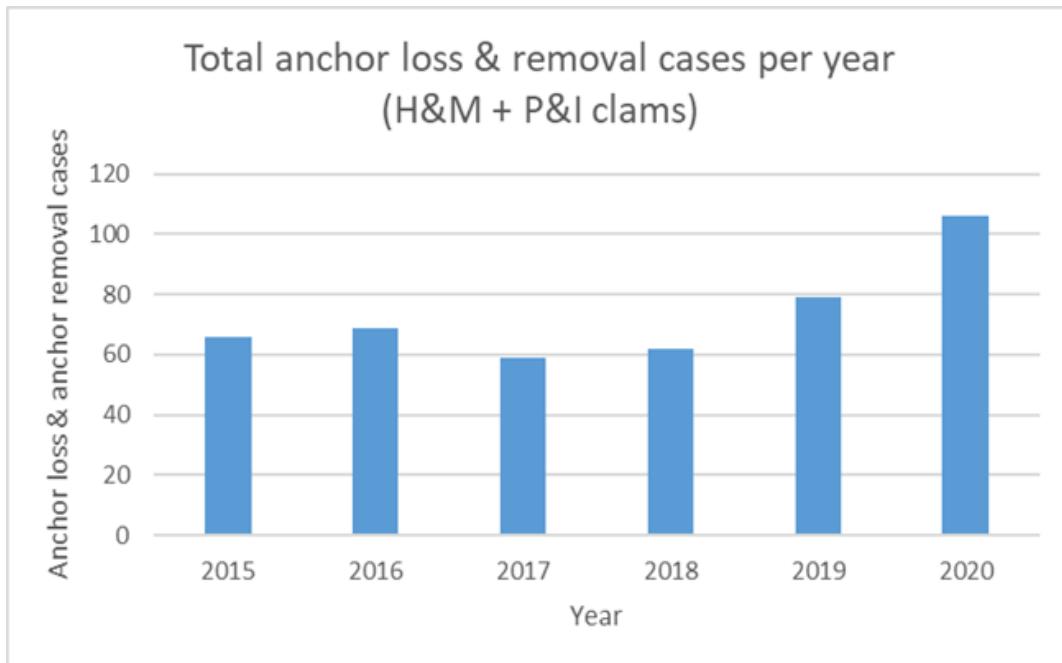
## Background

A growing number of anchor losses, anchor dragging, and anchor removal cases prompted DNV, Gard and The Swedish Club to collaborate on an anchor loss awareness campaign back in 2016. Despite the awareness raised then on the most frequent technical and operational issues, we are today still seeing an increase in cases. Might there be some new reasons for the increase in anchor loss and dragging incidents?

Due to congestion, ships are spending more time at anchorages and are anchoring in areas more exposed to extreme and sudden environmental conditions. This is likely due to the state of our global economy with recent years of economic downturn and the COVID pandemic with the logistical disruptions that have followed for both crew changes and cargo handling.

Due to the pandemic, we have also seen passenger vessels temporarily laid-up in exposed anchorages. Containerships and car carriers that did not often use their anchoring equipment now have to use it for extended periods of time while waiting in the queues outside loading terminals. Climate change also contributes to losses with more frequent extreme weather events and in locations previously known to be benign and safe. Climate change has also resulted in longer periods of high and fast water in river approaches, for example the [Mississippi](#) .

## Learning from Gard's claims data



Gard's claims data from 2015-2020 confirm an increasing trend in anchor loss and removal cases. We have also studied vessel movements which show that a vessel with an anchor claim dropped the anchor on average 28% more often and spent on average 27% longer time at anchorage than a vessel without an anchor claim.

Similarly, the vessel movement data revealed that during the same 2015-2020 period, a vessel with an anchor claim spent on average 18% longer time in bad weather during a year than a vessel without an anchor claim. Bad weather is defined as wind forces between Beaufort scale 8 - 12, where 8 equals gale forces and 12 hurricane forces.

## **Risks and limitations of a ship's anchoring equipment**

In most of the anchor claim cases, environmental risk factors, such as weather, strength of the currents, water depth and holding ground, played a significant role in the loss. In general, anchoring equipment is designed for temporary mooring in harbors or sheltered waters, but in today's real world many anchoring locations are outside sheltered waters.

We suspect one of the key issues is a general lack of awareness of the environmental loads for which anchoring equipment is designed. The anchoring equipment is not designed to hold a vessel off fully exposed coasts in rough weather or during frequent anchoring operations in open sea. In such conditions the loads on the anchoring equipment will increase to such a degree that its components may be damaged or lost owing to the high energy forces generated.

Through the International Association of Classification Societies (IACS) Class societies have agreed to a set of [unified requirements for anchoring equipment \(UR A1\)](#) and make reference to this in their Class Rules.

The anchoring Equipment Number (EN) calculations, as found in UR A1, are based on the following assumed environmental load conditions:

- Current velocity: max. 2.5m/s
- Wind velocity: max. 25m/s
- No waves (sheltered waters)
- Length of chain paid out scope 6-10
- Good holding ground

For ships with an equipment length greater than 135m, an alternative UR A1 environmental condition may be considered:

- Current velocity: 1.54m/s
- Wind velocity: 11m/s
- Significant wave height 2m

The IACS UR A1 has been revised recently and the revised requirements in UR A1, Rev 7, September 2020 (corrigendum published in September 2021) will apply to ships contracted for construction from 1 January 2022. The updates in that last revision include consideration for the front projected area and side projected area of large funnels in the equipment number calculations to account for their contribution to anchoring loads. This change may be required following the addition of scrubbers on many ships which increase the profile of the funnel and thereby affect how the wind applies force to the vessel.

## **Dragging anchor**

The most serious and very costly cases occur when a ship drags its anchor in strong currents or bad weather, leading to collisions with other nearby anchored ships, groundings and loss of the ship, pollution or damage to cables and pipelines on the seabed.

“Dragging anchor” means the ship drifts without holding power, even though it has been anchored. It is important to note that it can take some time for the crew to realize the anchor is dragging and the ship drifting. Once realized, it will take time to weigh (lift) the anchor, start the engines and restore the ship to full maneuverable condition, a period during which the ship may run dangerously close to other ships or structures, or into shoal water.

## **Where are anchors lost and required to be removed?**

The below heat map shows the locations of anchor losses and anchor removal cases recorded by Gard in the last six years. The map confirms that the concentration of cases (big circle sizes) is found in the areas with larger shipping ports and in areas more affected by strong currents and bad weather.



For example, the map shows there is a significant number of cases in and around New Orleans and the wider Mississippi River delta. 2019 and 2020 were exceptional years for high river related casualties, due to the extended period of high river conditions in the Mississippi River. When certain areas of the river are considered to have reached high water level, local authorities require all deep draft vessels that are not moored alongside or moored to a buoy to have at minimum three means to hold its position. This may be achieved by using both anchors in addition to the propulsion system or being aided by a tug as the third means of holding position. When using both anchors there is a higher risk of the chains getting crossed, entangled, and damaging the anchor.

The map also shows that there is a surprising number of anchor claims in and around Fujairah, UAE. This area is assumed to have benign weather and sea conditions. However, the water depth at Fujairah anchorage is considered deep waters and varies from 70-130 meters. 'Letting Go' the anchor in such deep water could cause the brake system to burn out and leave the windlass without control, damaging the windlass, bitter end, or in some cases resulting in total loss of the cable and anchor.

One of the key findings in casualty investigations is the importance of the crew being aware of the environmental loads their anchoring equipment is designed for. If these limits are not considered during shipboard anchoring operations, there can be significant damage to the ship – even beyond the loss of the anchor and the chain.

## **Recommendations**

Many [anchor losses are preventable](#) if proper maintenance and handling procedures are followed. Performing correct anchoring operations is vital to the safety of the vessel, and, prior to anchoring, the Master should take into consideration the following:

**Set a policy for the conditions requiring leaving the anchorage** \* -\* If a ship is anchored in an area exposed to weather, it is necessary to have a clear policy as to when to leave. There have been cases where Masters have been under commercial pressure not to leave an anchorage, and disasters have followed because the Master was tempted "to wait and see until the morning", although the weather forecast was bad.

**Respect the limitations of the anchoring equipment** – Masters must be particularly vigilant when anchoring close to shore in bad weather or in high rivers with strong currents and poor holding ground. In making the decision whether to stay or leave, the Master should also be aware of the design limitations of the anchoring equipment. Some Masters may not have full knowledge of these limitations; however, they are laid down by the class societies in their rules for calculating the dimensions, weights and strengths of the anchoring equipment. With the mentioned limitations in mind, it can be seen from instances of ships dragging anchors in bad weather that Masters have at times placed too much trust in their ship's anchoring equipment. Today's weather forecasts are usually very reliable and Masters should more often choose to weigh anchor and go out to sea in time if heavy weather is forecast.

**Train and mentor crew** \* -\* Anchoring a vessel safely can only be carried out with proper planning, a properly instructed bridge team, and when positive on-board management and leadership are shown. Owners and managers should ensure that such knowledge is transferred to junior officers through structured training and by making that knowledge available. Good seamanship is often best learned on the job whilst at sea. Proper anchor watches must be maintained which include the use of navigation equipment in setting up anchor watch alarms and parallel indexing. Extra precautions such as additional cable paid out and having engines on immediate notice should also be considered.

Gard has previously, together with DNV and The Swedish Club, published a free to download and share [anchor awareness campaign](#) including a [video](#) identifying the most frequent technical and operational issues, and steps crews and operators can take to address them. Our anchor awareness material remains highly relevant in preventing anchor losses and anchor dragging, so we recommend Members and clients to revisit our loss prevention material and sharing it with their crew.

[Video - November 2021 webinar with Gard, DNV, and the Swedish Club \(View only\)](#)

[Anchor%20awareness%20webinar%20on%2017%20Nov%202021%20-%20DNV%20presentation.pdf](#)

[Anchor%20awareness%20webinar%20on%2017%20Nov%202021%20-%20Gard%20presentation.pdf](#)

[Anchor%20awareness%20webinar%20on%2017%20Nov%202021%20-%20Swedish%20Club%20presentation.pdf](#)

*Disclaimer: It is important to emphasize that this publication is not to serve as a full guide on the risk while anchoring and how to anchor a vessel and should not replace requirements given by Authorities or Classification societies.*

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