

## Loss Prevention Circular No. 12-10

# Limitations of a vessels' anchoring equipment

Gard has seen an increasing number of cases involving lost anchors, and from class societies we learn that as many as one anchor per 100 ships is lost annually. The reasons for loss of anchors and chain are many, and include lack of seamanship and inadequate maintenance, but also instances of the chain and anchor breaking, leaving a question mark as to the quality of such parts as provided by the manufacturers.

In Gard, about one in 200 ships a year has an anchor related claim. Most of these are due to the loss of anchors at designated anchorages where the authorities require the lost items to be removed, thus resulting in a "wreck removal" case. The more serious and very costly cases are when a vessel starts dragging its anchor in bad weather, and where this leads to collisions with other vessels, groundings and loss of the ship, or to damage to cables and pipelines on the seabed.

### Strength and limitations of anchoring equipment

The rules for anchoring equipment, the grade, length and size of chain, number and weight of the anchors, the strength of the chain stoppers and the power of the anchor windlasses and the brakes, are established by the class societies. They can be found in the rules of the individual societies, or in the unified rules of IACS, the International Association of Class Societies. It is important to be aware that these are minimum requirements, and to know the assumptions made in the calculations.

For each vessel the class society will calculate an Equipment Number by using a formula, where the displacement of the vessel, the breadth of the ship and the height from the summer load waterline to the top of the uppermost house, as well as the profile view area of the hull, superstructures and houses above the summer load waterline are included. Thus, the forces on the ship by current and wind from both the front and the sides are taken into account. The formula is based on an assumption that the speed of the current may reach 2.5 m/sec, and wind speed of 25 m/sec, which represent quite high forces, but it is also assumed that the vessel can use a scope between 6 and 10, the scope being the ratio between length of chain paid out and water depth. However, large ships at deep anchorages do not have sufficient chain onboard to reach scopes of such magnitude.

If a ship is at anchor in ballast condition, the Master should also bear in mind that wind forces acting on his ship may be much larger than the calculations have accounted for, as larger ship side areas are now exposed, while the measurements entered in the formula was taken from the summer load water line. Vessels in ballast will also be more vulnerable if they have to move away in bad weather, as both the steering and the propulsion may be affected.

Class societies make it clear that the use of the anchoring equipment is only for the temporary mooring of a vessel, within a harbour or a sheltered area, when awaiting berth, tide, etc. It is particularly emphasized that the equipment is not designed to hold a ship off a fully exposed coast in bad



weather or to stop a vessel from drifting. The anchoring equipment, as designed in accordance with the class rules, will only hold the vessel in good holding ground, while the holding power is significantly reduced in poor holding ground.

### Recommendation

If a vessel is anchored in an area exposed to weather, it is necessary to have a policy as to when to leave. There have been cases when Masters have been under commercial pressure not to leave the anchorage, and disasters have happened because the Master was tempted "to wait and see until the morning", although the weather forecast was bad. In making his decision whether to stay or to leave, the Master should also be aware of the limitations of his 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 cases of ships dragging anchors in bad weather that Masters have at times placed too much trust in their vessel's anchoring equipment. Today's weather forecasts are usually very reliable and Masters should more often choose to weigh anchors and go out to sea in time if heavy weather is forecast.

The full text of the rules for anchoring equipment can be found in the document "Requirements concerning mooring, anchoring and towing", by searching the web pages of the International Association of Classification Societies: [www.iacs.org.uk](http://www.iacs.org.uk), or directly in [www.iacs.org.uk/vdunifiedrequirements/ur\\_a\\_pdf148.pdf](http://www.iacs.org.uk/vdunifiedrequirements/ur_a_pdf148.pdf).