



Chapter 53 – Stowage of Breakbulk Cargo (General Cargo)

In recent years, there has been a general decline of standards in the stowage of breakbulk cargo, resulting in cargo damage and claims.

There are various reasons for the decline of standards, namely:

- Use of bulk carriers for the carriage of breakbulk cargo
- improper dunnaging
- inadequate packing
- inadequate stowage skills of ships' officers.

53.1 Bulk Carriers



Figure 53.1: Medium-sized bulk carriers often replace tweendeckers on trades that have not been containerised or where, because of the type of cargo, it is impossible to use containers.

A ship fitted with tween decks is ideal for the carriage of breakbulk cargo. The many compartments facilitate the carriage of different commodities and make port rotation easier, usually avoiding overstows. Provided care is taken over the stowage, cargo damage, particularly crushing damage, should be avoided. Unfortunately, tweendeckers are in short supply and cannot compete economically with the medium-sized bulk carrier. Medium-sized bulk carriers have, therefore, replaced, or are replacing, tweendeckers on trades that have not been containerised or where, because of the type of cargo, it is impossible to use containers.

The bulk carrier's two main disadvantages, as compared with the tweendecker, are the height of the holds (about 12 m as compared with 6 m for the lower hold of a tweendecker) and the sloping lower wing ballast tanks. Most breakbulk cargo is stowed using forklift trucks, but the sloping lower wing ballast tanks prevent the forklift trucks manoeuvring close to the side of the holds, making stowage difficult. The height of the holds also prevents stowage from the tank top to the deckhead using forklift trucks. These problems are usually overcome by loading the cargo in horizontal tiers on top of which are placed steel plates on which forklift trucks can manoeuvre to load the next tier. It is clear that crushing damage may occur, not just because of the height of the stow, but due to the use of the steel plates and forklifts.

53.2 Dunnaging

Proper and adequate dunnaging materials must be used during the stowage of breakbulk cargo. This applies to all cargo ships, and is particularly important for bulk carriers.

Timber and timber products, such as plywood, are the main types of dunnage materials in use, even though timber products have risen in price over the past few years. Other cheaper materials are sometimes used as a substitute, but are generally found to be inadequate. Because of the price of timber, charterers, or whoever is paying for the dunnage, are often reluctant to provide dunnage that is adequate both in quality and quantity.

Dunnage is used for the following reasons:

- To spread the load over the surface area of the tank top, tween deck or deck, and also between horizontal tiers of cargo
- to increase friction between steel surfaces (tank top and cargo, etc)
- to tie the cargo together to prevent any movement in the stow
- to keep the cargo away from the tank top or deck and away from the steel structure at the ship's sides, thereby preventing contact with moisture formed on, or running down or across, steel surfaces and permitting the water to flow to the bilges
- to block void spaces, brace and support cargo, and block cargo to prevent movement
- to create a divide, an auxiliary deck or level surface.



Figure 53.2: An example of timber dunnaging for steel plates.

Dunnage is an absolute necessity for proper stowage of breakbulk cargo and, when cargo damage occurs, the failure to use adequate or good quality dunnage may make it difficult to refute allegations of bad stowage by cargo interests and liability for cargo claims. Due to the difficulties in the stowage of breakbulk cargo in bulk carriers, proper and adequate use of dunnage is vital and, although cost is a consideration, this is usually minor in proportion to potential claims.

When timber dunnage is supplied, the Master and the ship's officers should check that the timber is properly seasoned. Green or wet timber contains up to 35% water. Shrinkage of green timber results in the loosening of nails and could mean that any blocking or bracing structure collapses. Timber should also be without dry rot, without infestation, without splits (split timbers cannot be fastened properly and lack strength) and of adequate scantling.

Poor quality timber should be rejected and, as the ship's officers will probably have to sign for the timber supplied, they should check that the amount supplied corresponds to the receipt they sign.

53.3 Packing

One of the main causes of damage to breakbulk cargo is inadequate packing. Pallets, boxes, crates and other forms of packing are usually designed for a single transit. During the course of this transit, the unit must survive initial storage, loading onto a road or rail vehicle, transit to a port, handling at the port into temporary storage, loading onto the ship, stowage, static and dynamic forces related to the ocean passage, breaking out of stow and unloading, handling into temporary storage, handling onto a road or rail vehicle, transit to the receiver's premises and handling at the receiver's premises. There are regularly at least 10 handling operations involved with every transit, but by far the most arduous is the sea voyage. It is therefore very important that packaging is taken into account when planning the stowage of breakbulk cargo, particularly when a stow could be as high as 12 m on a bulk carrier. Packaging should be inspected prior to loading and, if inadequate, the cargo should either be rejected or the B/Ls properly claused with regard to the inadequacy of the packing. It is difficult to generalise on what should be considered as inadequate packing, but some examples are:

- Flimsy pallets that bend and break when lifted
- the cargo on the pallets is laterally greater than the surface area of the pallet platform, which results in the cargo projecting over the sides and becoming torn or split on the pallet edges, causing the load to become unstable
- the load on the pallet is only secured with shrink-wrapped plastic sheeting, which is not acceptable as a securing material and leads to instability of the cargo on the pallets
- some of the bottom bags of the pallets lose their contents due to being pierced by the forks of forklift trucks, which impairs the stability of the stow on the pallet
- packages on pallets are not interlocked making the whole unit unstable, particularly if the goods are slippery
- bundles of pipes secured with wire are wrongly arranged in the bundles, causing slackness in the bundles resulting in bending and end damage

- heavy drums loaded on pallets that are only secured with flat metal strapping bands which eventually become slack and the load becomes loose



Figure 53.3: Heavy drums that have broken loose from inadequate strapping.

- wooden cases that have a strong base but with weak covers that lack rigidity because they are not fitted with a frame. This can result in the cases collapsing in a stow and the stow collapsing. It is difficult to see this weakness at the time of shipment
- plywood bundles that are packed in such a manner that the packing is too light for the weight of the bundle and the bearers.



Figure 53.4: Plywood bundles that have broken out of packing that is insufficient for the weight of the bundles and bearers.

If the packing is inadequate and incapable of withstanding the rigours of an ocean voyage, good stowage may not prevent the cargo from sustaining damage. Furthermore, inadequate or weak packing can undermine the stability of a stow and in extreme cases lead to its eventual collapse. Without proper supervision during loading, inadequate or weak packing is often only discovered at the discharge port when the cargo is unloaded in a damaged condition. It is difficult to determine at the discharge port whether the cargo was damaged due to bad stowage or as a result of inadequate packing. Cargo claims will eventually be directed to the shipowner and may prove costly and impossible to defend, which is why identifying poor packaging at the point of loading is crucial.

It is far more difficult to cater for stowage of cargo with weak or inadequate packing on a bulk carrier than on ships with tween decks. On a tweendecker, top stowage either in the lower hold or tween deck can be arranged for suspect or weak packing. However, top stowage on a bulk carrier is far more limited, particularly when there are many loading or discharge ports.

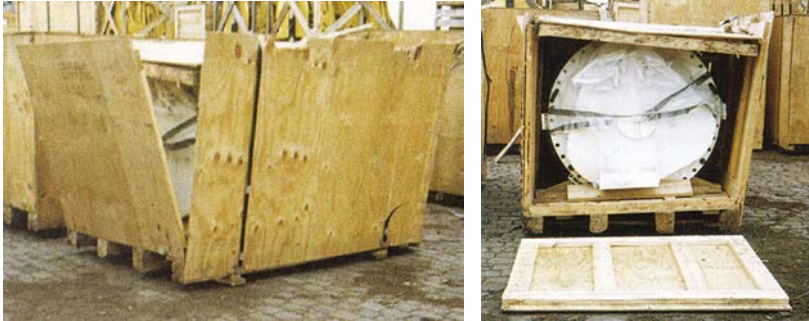


Figure 53.5: Wooden cases that lack structural rigidity.

Even if packing is adequate, it is only designed to withstand certain pressures, and usually these pressures are determined for static conditions. Packing crates and cases of medium size should be able to withstand the superincumbent load of five similar items stowed above. Properly designed palletised units of 1,500 kg should be capable of supporting a 6,000 kg load under static conditions, which would result in a five-tier pallet stow of about 6 m in height. Steel drums are designed to survive under a static load of a 3 m height of units of the same weight. Proper stowage of these types of commodities can be arranged on a tweendecker, but the problem is far more difficult on a bulk carrier, even if vast quantities of dunnage are used to spread the loads evenly.

Various international and national organisations issue guidance stipulating the strength and construction of packing. These include the IMDG Code, British Standard, USA Packing Standard and the German Industry Standard (DIN) (References 19, 81, 82 and 83). For example, under DIN, cases have to withstand a static vertical pressure of 1.0 T/m² during sea transit. Ships' officers cannot be expected to test packaging to see whether it complies with these standards, but they should be aware that standards do exist and that shippers are under an obligation to comply with the rules and regulations of national and international organisations. Also, packaging has to be properly marked, particularly if there are special requirements for lifting or stowage. It is important to comply with wording or markings on packages such as:

- Stow away from heat
- top stowage only
- position of weight point
- marks for lifting points
- marks for forklift handling
- this way up arrows.

If it is impossible to comply with the instructions on the package, particularly with regard to stowage, that particular package or parcel of cargo should not be loaded.

53.4 Stowage Skills

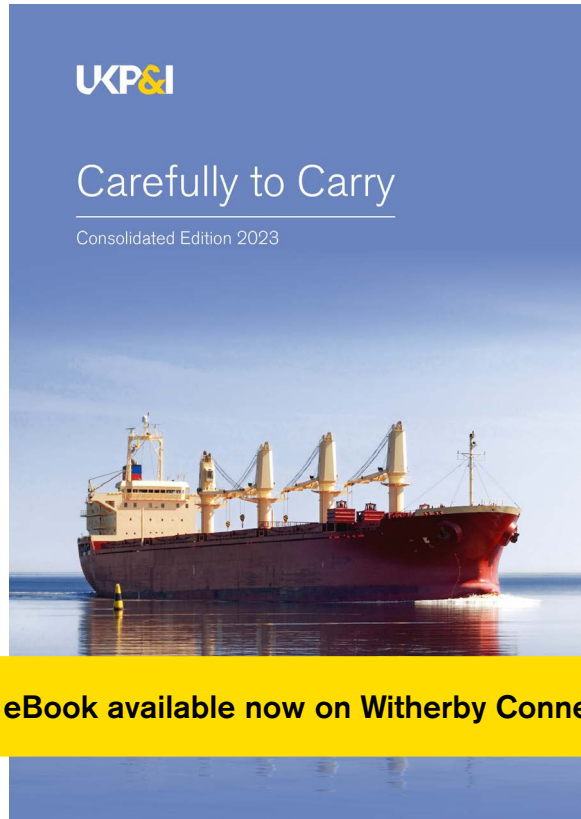
The huge increase in containerisation has brought about a gradual decline in the traditional seafaring skills of loading and proper stowage. The result is that a Master or chief officer on a medium-sized bulk carrier may have never seen a general cargo loaded or stowed, and they may also have never received any tuition or training in a shore-based establishment. If a bulk carrier is chartered to load general cargo, the Master and chief officer will probably rely on the charterer's supercargo, if any, to advise on stowage, or on the stevedores' expertise. The result may be a series of expensive cargo claims.

53.5 Recommendations

It is recommended that when owners know that their Masters or deck officers do not have the necessary expertise to properly load and stow general cargo, particularly on bulk carriers, expert advice should be obtained. Club correspondents have the local knowledge to advise Members on experts and surveyors in their area. Even if the Master and deck officers have some skill in the loading of breakbulk cargoes, expert advice should be sought if it is suspected that the packaging of any commodity is inadequate.



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