UK P&I CLUB

Carefully to Carry

SEPTEMBER 2006

Stowage of breakbulk cargo (general cargo)

It is apparent that it is of paramount importance to use proper and adequate dunnaging materials during the stowage of breakbulk cargo

Many *Carefully to Carry* articles have mentioned, and given advice, on the stowage of different commodities which could loosely be described as breakbulk cargo. However, no article has yet dealt generally with the subject of stowage of breakbulk cargo. In recent years there appears to have been a general decline of standards in the stowage of breakbulk cargo resulting in cargo damage and claims.

The Committee considers 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.

Bulk carriers

The ideal ship to use for the stowage of breakbulk cargo, is a ship fitted with tween decks. This type of ship is designed 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, especially crushing damage, should be avoided. Unfortunately, tween deck ships are in short supply and cannot compete economically with the medium sized bulk carrier. Medium sized bulk carriers have therefore replaced, or are replacing, tween deck ships 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 tween deck ship, are the height of holds (about twelve metres as compared with

"The carrier shall properly and carefully load, handle, stow, carry, keep, care for and discharge the goods carried."

Hague Rules, Articles iii, Rule 2

Carefully to Carry Advisory Committee

This report was produced by the Carefully to Carry Committee – the UK P&I Club's advisory committee on cargo matters. The aim of the Carefully to Carry Committee is to reduce claims through contemporaneous advice to the Club's Members through the most efficient means available.

The committee was established in 1961 and has produced many articles on cargoes that cause claims and other cargo related issues such as hold washing, cargo securing, and ventilation.

The quality of advice given has established Carefully to Carry as a key source of guidance for shipowners and ships' officers. In addition, the articles have frequently been the source of expertise in negotiations over the settlement of claims and have also been relied on in court hearings.

In 2002 all articles were revised and published in book form as well as on disk. All articles are also available to Members on the Club website. Visit the Carefully to Carry section in the Loss Prevention area of the Club website www.ukpandi.com for more information, or contact the Loss Prevention Department.

six metres for the lower hold of a tween decker), and the sloping lower wing ballast tanks. As most breakbulk cargo is stowed by the use of fork lift trucks, the sloping lower wing ballast tanks prevent the fork lift 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 deck head using fork lift trucks. These problems are usually overcome by loading the cargo in horizontal tiers on top of which are placed steel plates on which fork lift trucks can manoeuvre to load the next tier. It can readily be seen 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.

Dunnaging

It is apparent that it is of paramount importance to use proper and adequate dunnaging materials during the stowage of breakbulk cargo, and this is especially true in the case of bulk carriers.

Timber and timber products such as plywood, are still the main type 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 which 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.

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 result in allegations of bad stowage by cargo interests and liability for cargo claims being difficult to refute. Because of 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% of 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.

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 on to a road or rail vehicle, transit to a port, handling at the port into temporary storage, loading on to the ship and stowage, static and dynamic forces related to the ocean passage, breaking out of stow and unloading, handling into temporary storage, handling on to road or rail vehicle, transit to the receiver's premises and handling at the receiver's premises. There are probably a minimum of ten 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 twelve metres on a bulk carrier. Packaging should be inspected prior to loading and if inadequate, the cargo should either be rejected or the bills of lading properly claused in regard to the inadequacy of the packing. It is difficult to generalise on what should be considered as inadequate packing, however, listed below are some examples:

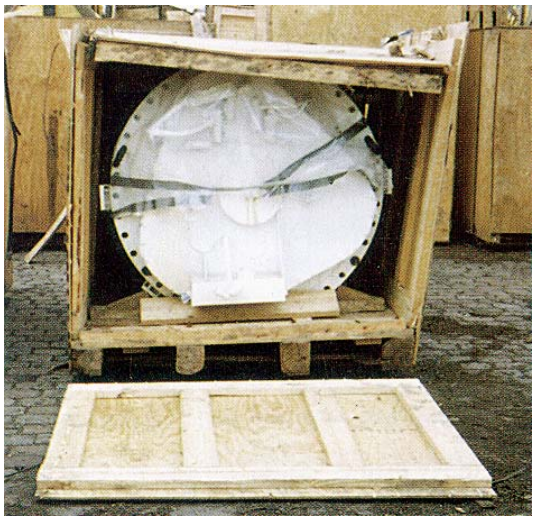
- Flimsy pallets which bend and break when lifted.
- The cargo on the pallets is laterally greater than the surface area of the pallet platform which results in the cargo projecting over the sides and becoming torn or split on the pallet edges causing the load to become unstable.
- The load on the pallet 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 leak their contents due to being pierced by the forks of fork lift trucks which impairs the stability of the stow on the pallet.
- Packages on pallets are not interlocked making the whole unit unstable. This is especially true when the goods on the pallet 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 which are only secured with flat metal strapping bands which eventually become slack and the load becomes loose.

Heavy drums that have broken loose from inadequate strapping

- Wooden cases which have a strong base but with weak covers which lack rigidity because they are not fitted with a frame. This can result in the cases collapsing in stow and the stow collapsing. It is obviously difficult to see this weakness at the time of shipment.

Wooden cases that lack structural rigidity



- Plywood bundles that are packed in such a manner that the packing is too light for the weight of the bundle and the bearers.

Plywood bundles that have broken out of packing that is insufficient for the weight of the bundles and bearers

It should be realised that if the packing is inadequate and considered 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 very 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 or ports, 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.

Again, it should be pointed out that it is far more difficult to cater for stowage of cargo with weak or

inadequate packing on a bulk carrier as compared to ships with tween decks. On a tween deck ship, 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, especially when there are many loading or discharge ports.

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 1,500kg should be capable of supporting a 6,000kg load under static conditions, which would result in a five tier pallet stow of about six metres in height. Steel drums are designed to survive under a static load of three metres height of units of the same weight. Clearly, proper stowage of these types of commodities can be arranged on a tween deck ship, but the problem is far more difficult on a bulk carrier even if vast amounts of dunnage are used to spread the loads evenly.

Various international and national organisations such as the IMDG Code, British Standard, USA Packing Standard and the German Industry Standard (DIN), stipulate strength and construction of packing. For example under German Standard (DIN) cases have to withstand a static vertical pressure of 1.0mt/m2 during sea transit. Ships' officers cannot be expected to test packaging to see if 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 especially if there are special requirements for lifting or stowage. Wordings or marks on the 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

should all be complied with. If it is impossible to comply with the instructions on the package especially in regard to stowage then that particular package or parcel of cargo should not be loaded.

Stowage skills

Before the containerisation revolution, most ships' deck officers were properly trained during their career in the skills of loading and the proper stowage of breakbulk cargo. These skills were mainly obtained through practical experience, but some tuition was given in shore based colleges and institutions. Gradually these skills have been lost with older deck officers and masters retiring or taking shore employment. 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 he also may have not 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 super cargo, if any, to advise on stowage or on the stevedores' expertise. The result may be a series of expensive cargo claims.

Recommendations

The Committee recommends that when owners know that their masters and deck officers do not have the necessary expertise available to properly load and stow general cargo, particularly on bulk carriers, then expert advice should be obtained. Club correspondents have the local knowledge to advise Members on experts and surveyors in their areas. Even if the master and deck officers have some skills in the loading of breakbulk cargoes, expert advice should be sought if it is thought that the packaging of any commodity is inadequate.

For further information please contact:
Loss Prevention Department, Thomas Miller P&I Ltd
Tel: +44 20 7204 2307. Fax +44 20 7283 6517
Email: lossprevention.ukclub@thomasmiller.com