



Carefully to Carry

Carriage of steel

This article emphasises the susceptibility of steel cargoes to damage, much of it pre-shipment in origin; hence, where damaged cargo is presented for shipment, bills of lading should be rigorously claused and any damage claimed on out-turn intelligently surveyed.

Introduction

It is an economic fact that the world has a greater potential to produce steel than it has to use it. This means that steel trading is subject to what may be called a buyer's market. The profit margins are small and the competition is intense.

This trading climate has produced an industry where only the most efficient can survive, an industry that is highly automated, where the labour force, although comparatively small is highly skilled and highly paid, The plant is very expensive and needs to be used to its utmost potential if it is to be worked economically. Anything that leads to delay on the production lines, or that requires extra handling, increases the cost of the product. Any steel delivered damaged or blemished will almost certainly be the subject of a claim from the receivers. Indeed, if the cargo is discharged in anything other than the condition described in the bills of lading, then claims against the carrier can be expected.

The USA probably imports more steel than any other nation in the world, largely from Japan, Northern Europe, particularly from the port of Antwerp, and more recently from Russia. Steel is often imported into the USA by merchants who are in essence 'middlemen'. These steel middlemen in common with the industry in general, work to very narrow profit margins and are accordingly extremely claims conscious. A merchant may, for example, have ordered coils of say 1120mm width, knowing that he had buyers for coils of 510mm and 610mm widths. When the coils arrived he would cut them to the required size. If however the coils arrived with their edges crimped or cut he would be unable to do this. In the same way, while the bending of the flange at the extreme end of a beam may in itself seem unimportant, this beam may have been ordered in a 20 metre length, the merchant knowing that he has a market for 3 metre and 6 metre long beams. In both cases, the merchant may well find after cutting to the width and length he needs, that he is left with material on his hands of a width and length that is not readily marketable. Modern business methods do not encourage large stock holding and merchants do not want to keep capital tied up in goods which are deteriorating while they are in their custody.

Further the merchant is at the mercy of the steel market where rapid fluctuations in demand may play havoc with the price. A cutback in motor vehicle production, a change in the price of domestic steel, or a variation in the import regulations may leave him with large quantities of steel on his hands for which he cannot get a profitable price. In these circumstances, an aggressive attitude may be expected towards carriers with regard to any damage for which they can possibly be held responsible. In fact, the import of steel into the USA gives rise to more claims against ocean carriers than in any other part of the world.



"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.

This article describes the more common types of steel products transported and their susceptibility to damage. It emphasises the importance of clausuring accurately the bills of lading and makes some recommendations as to stowage and the way in which cargoes found damaged on outturn should be examined. The article draws particularly on knowledge of the Antwerp trade, but much of what is said applies equally to the trade from Japan. Indeed, it is hoped that it will be relevant to those engaged in the carriage of steel by sea wherever in the world they may operate. It is also hoped that it will help to reduce the amount of claims directed against carriers by sea.

Types of steel products

Basically, there are three types of steel commonly carried by sea in appreciable quantities; sheets, rolled sections and small section material, rods and wire.

Steel sheet

Hot rolled coils

Steel sheet is mainly carried in the form of coils, but smaller quantities are frequently carried in packs. It is produced by heating and rolling steel ingots through reduction mills. As the thickness of the steel is reduced, its length increases and, for convenience in handling the long narrow sheet is rolled into a coil. The coil is then tightly strapped through the core and around the circumference and made ready for transporting to the loading port. These coils are described as hot rolled coils or raw steel and they will require further processing in the country of destination. The import of raw steel into the USA has been decreasing.



*Photo 1. Coils of hot rolled steel
These coils are usually between 1.20 and 4.50 metres in diameter and weigh between 5 and 15 tonnes each*

Cold rolled coils

Instead of being prepared for shipment as hot rolled coils, the steel may be further processed in the country of manufacture. In the first place, it is passed through baths filled with a weak acid solution to remove rust and scale. This process is described as pickling. The sheet is then washed, dried, oiled and re-coiled before being passed on to the cold reduction mill, where it will be cold rolled under tension, the end result being a product of better temper and improved finish.



*Photo 2. Coils of cold rolled steel
The higher quality surface finish of cold rolled steel makes it much more susceptible to rust damage. It is for this reason that cold rolled steel is usually packed in bituminous paper and kept away from moisture*

Further processing

Cold rolled sheet may be further processed by dipping the sheet into a bath of zinc to produce coils of galvanised steel sheeting. Alternatively, tin plate may be produced by covering one or both surfaces of the sheet with a thin layer of tin.

Wrapped

Cold rolled steel, galvanised steel sheet and tin plate are of course very much more valuable than hot rolled sheet. Coils of cold rolled steel, galvanised steel sheeting and tin plate will be strapped in the same way as hot rolled coils and in addition, before leaving the factory for transportation to the port of loading, will normally be wrapped in bitumenised paper and then covered with fine gauge steel sheeting which is itself secured in place with metal strapping.

Packs

On occasions cold rolled sheets, galvanised sheets and tin plate may be carried in packs instead of coils. The bundle of cold rolled sheets forming a pack is secured with steel strapping. It is then usually completely wrapped in bitumenised paper and covered with a metal envelope. The package will then be secured by metal straps to wooden skids.

Rolled sections or constructional steel

Rolled sections or constructional steel are usually fairly massive sections, in the form of 'H', 'I' or 'U' (channel) beams. They are produced by passing the steel ingots through a series of rollers.

Small section material rods and wire

Small section material

Small section material, rods and wire may be composed of special steel alloys or may consist of steel that has been given a special finish at the factory. Small section material is usually destined for use in the manufacture of machine tools, of components for electrical machinery, or of steel furniture. Other uses to which small section material is put

are the construction of ladders for fire escapes, of racks in factories or warehouse, of railings and of numerous other appliances or fittings where a quality finish may be required. Small section material is shipped in bundles and may or may not be wrapped.

Reinforcing bars

Reinforcing bars may be mentioned here: they are often referred to as 'rounds' or 'concrete iron' or 'deformed reinforcing bars' or just 're-bars'. The use of the word 'deformed' means that the bars have ridges in various patterns introduced into their surface during production. These ridges improve the bond of the bar with the concrete and thus increase the constructional strength of the finished structure.

Wire rod

Wire rod is largely produced by drawing larger bars through dies. It is prepared for shipment at the factory by being rolled into coils and usually four or five coils are then strapped together to form a unitised coil bundle (see Photo 3).

Bright basic wire

In the country of destination the wire will be cold drawn through dies so that the gauge is reduced and the wire elongated and polished to form what is called bright basic wire. Wire rod is used in the manufacture of numerous goods such as nails, wire mesh, galvanised wire and a large quantity of this wire is chromed and used in the manufacture of supermarket shopping baskets and trolleys.

Susceptibility to damage

Rust

All steel is susceptible to damage by rust. Rusting is a continuous and progressive process. The longer it continues, the greater the damage to the product. Rust that appears insignificant at the time the consignment leaves the mill or is loaded onboard the ocean-going ship, may develop to a serious extent by the time the consignment reaches the port of loading on the one hand and the port of discharge on the other, even though there has been no failure whatsoever on the part of the inland or ocean carrier to care properly for the cargo whilst it was in his possession.



*Photo 4. Constructional steel ('1' beams)
Note that the beams are stacked correctly, with the flanges 'in and out'*



Photo 3. Unitised coil – bundles of wire rods

Mill scale

When raw steel leaves the mill it is covered by a thin layer of hard oxide known as mill scale. This mill scale will protect the steel from deterioration by rust as long as it remains an unbroken skin covering all surfaces of the product. Unfortunately, mill scale is very brittle and is easily shattered or splintered off the steel, and when this happens, rusting takes place. Rusting is accelerated in areas where bare steel and mill scale are in close proximity. The ordinary shocks to which steel products are subjected in their transport to the carrying ship are sufficient to jar some of the scale off the surface of the steel. The scale will also gradually fall away if the steel is left exposed to the weather for any appreciable length of time.

Rust damage to coils

Where coils are concerned, the coiling process itself is often sufficient to loosen the scale and expose the steel to rusting. With hot rolled coils, much of the rust will probably be removed in the normal course of further processing in the country of destination; but if by that time the rust has developed so far that the surface of the steel is damaged or pitted, the steel may be unfit for the purpose for which it was originally intended. The higher quality surface finish of cold rolled steel makes it much more susceptible to claims for rust damage than is the case with hot rolled coils. It is for this reason that cold rolled steel is usually packed in bituminous paper.

Rust damage to constructional steel

Constructional steel on the other hand is usually not packed and will almost always be rusted to a greater or lesser extent. It is not unusual for steel producers to fill orders for constructional steel from stock which has been held on their premises for some time. It is usually transported from the factory to the loading port by rail, either in open or covered wagons, or in lighters which are usually covered but may not be weather tight so there is a danger of free water collecting in the bottom. Cargoes are frequently assembled a week or a fortnight before the ocean-carrying ship arrives at the loading berth, and as this steel is usually stored unprotected

in the open, it will be exposed not only to the weather but also to the atmosphere. Where the atmosphere contains salts and/or is polluted the steel can be seriously attacked. The amount of rust on constructional steel will largely depend on the amount of handling to which it has been subject and on the length of time it has been exposed.

Rust damage to small section material

As we have said, small section material may or may not be wrapped, in any event, it should be transported and stored under cover, protected from the elements. Unfortunately, this is not always done and frequently piles of small section steel rods are to be seen stored in the open, covered perhaps by very patched and old tarpaulins. Complaints can be expected if material of this type is received rusty since as already explained, much of it is used in the production of office furniture and fittings where appearance is very important. This is particularly true of painted material which is highly susceptible to rusting where the surface has been scratched.

Rust damage to reinforcing bars

Reinforcing bars are normally shipped unprotected in bundles which can retain a lot of water if they have been exposed in open storage for any length of time. As the wetness on the outside of the bundles dries quickly, the interior of the bundle may be considerably more rusty than is apparent from an examination of the outside. Unfortunately, the 'purpose-built' deformations on the bars are susceptible to erosion by rusting. If the reinforcing bars are subject to strict specifications (as for example in any US Federal project) then erosion of the deformation may mean that the goods are off specification.

Rust damage to wire rod

Wire rod is usually shipped unprotected, In many cases the pickling and other processing the wire rod later undergoes will be sufficient to remove any rust that may have formed. If on the other hand, the surface of the wire has been damaged or pitted, it may be necessary to eliminate this by reducing the diameter of the wire in which event the wire may be off specification.



Photo 5. Typical small section steel

Physical damage

As we have seen, the nature of the steel industry is such that any physical damage such as bending or denting is likely to give rise to a claim.

Loose and deformed coils

Where coils are concerned, care should be taken not to displace or break the steel strapping. It is particularly important where coils are brought forward in railway wagons, that they be well secured so that they do not come adrift with the motion of the train (which may be considerable if the wagons are shunted). If the strapping is displaced or broken the coil will become loose and possibly deformed. An added danger with loose coils is that abrasive matter may get between the turns of the steel and chafe or scratch the surface. We have already noted that any deterioration of the surface of either hot or cold rolled steel may be serious since, if pitting, scoring and chafing are not removed, the surface of the finished plate may be marred. Blemishes of this type cannot usually be eradicated without some waste of material.

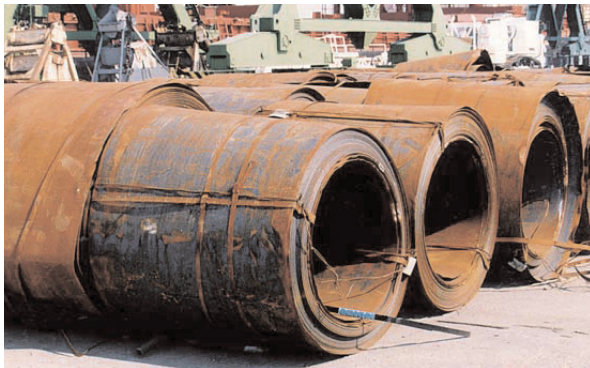


Photo 6. Hot rolled coils which have telescoped

Telescoping

Coils may also become telescoped, that is, some laps may be projecting on one side of the coil; this in itself is not of great importance unless the telescoping is excessive, in which case it may be difficult to put the coil onto the de-coiling machine at the receiver's premises.

Crimped edges

The edges of coils may be crimped by the careless use of unsuitable lifting equipment. The misuse of handling gear can lead to chafing damage even when the coils are wrapped. The edge of packaged sheets may be crimped or bent or cut if they overhang the wooden bearers.

Distortion

Constructional steel can also be damaged if the flanges are bent by the careless use of lifting gear, and if the bundle is incorrectly packed, the whole section may be distorted.

Kinked or bent smaller section material

If the smaller section material is bent or wire rod is kinked, the value of the material will be reduced. Thus if the rod is kinked or bent, it may damage the dies through which it is drawn and the finished product may have a score mark or nick that can only be removed by reducing the diameter of the wire, which again involves the risk of putting it out of specification. Heavily twisted or nicked wire cannot be straightened satisfactorily and therefore may be regarded as scrap.

Clousing bills of lading for pre-shipment damage

From all that we have said it must be obvious that before steel cargoes are loaded into the ship they have already been subject to considerable risk of damage, both by exposure to the elements, and by reason of the number of times they have been handled. It is extremely important that any pre-shipment damage be noted on the bills of lading and, to this end, it has been found by experience that the services of a skilled and conscientious surveyor are usually necessary. Masters and agents of ships stemmed to load steel cargoes should contact the local UK Club correspondent who can normally arrange for a surveyor to be instructed to attend the loading of cargo.

Rust damage

Nowhere is the need to clause bills of lading greater than in the case of rust. Without exception, whenever a consignment is rusty this should be stated in the bills of lading. Cargo interests may well insist that the rust to be seen is normal or customary, or will not affect the value of the cargo, or will be removed in any event by further processing, and therefore that the bill of lading can be issued clean without any danger of prejudicing the interest of the carrier.

Representations of this type are to be ignored. The best way of protecting the carrier's interests is to clause the bill of lading. If the rust is indeed normal or customary there should be no difficulty in the bills of lading being negotiated through the banks. The master's job is not to concern himself with the marketability of the cargoes that he carries, he should simply describe the condition of the cargo as he sees it.

Further, when clousing bills of lading against rust, it is essential not to qualify the word rusty in any way by using words such as 'atmospherically' or 'superficially' or 'slightly'. The reason for this is simply that rust which may appear on loading to be only slight, may have worsened progressively during the voyage (without there being any fault on the part of the carrier in the care of the cargo) to such an extent that the cargo is pitted or otherwise seriously affected on discharge. Commonsense would tell us that the damage seen on outturn in this type of case is directly consequent on the damage noted on loading, but it is not always so easy to persuade a court to see things in this way. If the damage on outturn is more severe than the damage noted on loading a court may be tempted to attribute the deterioration in the condition of the cargo not to the natural development of the rusting process but to some alleged fault of the carrier in the care of the cargo. One of the best ways therefore of minimising this danger is simply to describe rusty cargo as 'rusty'.

Club circulars

In 1963 and 1964 the London-based P&I clubs issued circulars setting out certain clauses that were suitable to describe pre-shipment rust damage to steel. Probably the most effective of these have been found to be the following (to be used where appropriate):

- Rusty.
- Rusty edge.
- Rusty end.
- Top sheets rusty.

- Rust on metal envelopes.
- Goods in rusty condition.
- Wet before shipment.
- Covered with snow.

Where goods are shipped packed the following clauses may be used where appropriate:

- Covers wet.
- Covers rusty.
- Packing wet.
- Packing rusty.

Physical damage

Any physical damage such as denting or bending should also be entered on the bill of lading. Where the packing is damaged this should be noted too, together with any obvious damage to the contents.

Describe accurately

It must be emphasised that the clauses used must accurately describe the apparent condition of the steel shipment.

Loading and stowage

Residues

Residues of previous cargoes which may have an adverse effect on steel, particularly salt and fertilisers should be very carefully removed.

Bulk carriers

It has been found from experience that the most suitable ships to be engaged in this trade from the point of view of loading and stowing are bulk carriers with wide, large hatches and unobstructed holds.

Handle with care

The loading and stowage of steel cargoes calls for skilled and experienced stevedores. Steel can easily be damaged or indeed damage the ship, if not handled with care, as each separate lift is likely to weigh in the region of five to twelve tonnes. In Antwerp, it has been found that the cranes used for loading and discharging containers are the very best equipment for handling steel cargoes, where conventional means are used, lifting gear such as wire slings, spring laid rope strops or chains should be adequately protected to avoid damaging the edges of coils. Winch drivers should be instructed to avoid violent acceleration or braking when lifting or lowering coils, Forklift trucks should have the forks adequately protected with timber, unless they are specially designed for use with steel cargoes and crowbars should only be used by stevedores in handling material not capable of being damaged thereby.

Steel is not an easy cargo to stow. In making recommendations, it should be appreciated that we are describing the ideal. In practice, the ideal is not always possible and we know from experience that satisfactory alternative arrangements can be made where the stowage cannot be effected exactly as we recommend. Our comments imply no criticism of other methods of stowage that may be adopted and which have been found to achieve equally good results.

Locking coils

Generally, coils should be given bottom stow. The method of stowing coils that has been used with considerable success in Antwerp consists of stowing them in athwartships rows with their major axes horizontal and in the fore and aft line. The bottom tier of coils should stand on double lines of good dunnage placed athwartships so that any moisture that may collect on the tank top or ceiling of the hold can run to the bilges without damaging the cargo. This dunnage also helps to spread the weight of the coils over the tank top plating. The first coils loaded are placed in the wings against the bulkhead and then the row is extended inwards towards the centre line of the ship. Invariably a gap will be left on the centre line and the first coil of second tier in that row will be placed in that gap. The next coils of the second tier will be placed in the wing above and outboard of the extreme wing coils of the first tier and these three coils, that is the one on the centre line and the one in each wing, will effectively jam and block off the first tier of that row. These three coils are known as the locking coils. The remainder of the second tier in that row will be placed in the cantlines of the coils beneath them. For each further tier the same procedure is followed until the first row has been built up to the required number of tiers. Coils of up to ten or twelve tonnes in weight may be stowed in three tiers but over this weight it is better that they should be started in the same way, loading the first two coils in the wings and against the first row loaded. Working in toward the centre line and then placing the three locking coils. Reference to Fig 1 will help to make this method of stowage clear.

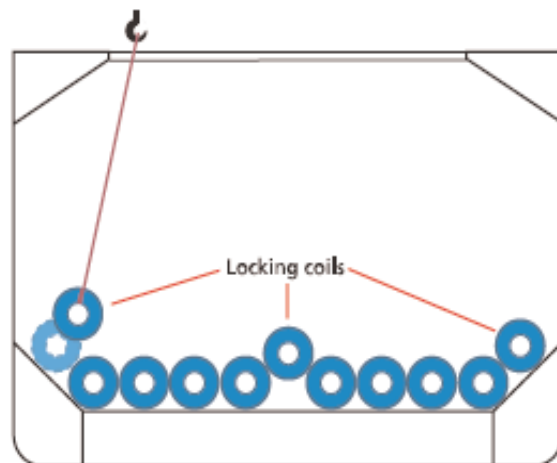


Fig 1. Locking coils

Loading and stowing coils

The manipulation of coils into place where the crane or derrick cannot plumb the coil into the desired position calls for the exercise of ingenuity and skill. If one attempts to swing into position the coils to be stowed in the wings or at the fore or aft ends of hatch, the coils may frequently be damaged by being positioned at the wrong instant. Equipment and the use of dedicated trucks has now been evolved which has improved immensely the means by which coils of steel can easily be properly handled.

It is better to stow coils at least two tiers high. A single tier of coils nearly always allows movement, and as result, the stow may work loose. If there are not sufficient coils to make two complete tiers over the whole surface of the hold then the hold should be partially floored out with two tiers of coils so that the stow ends in a brow or wall across

the hold. The face of the coils should be protected by a strong timber fence when other cargo, such as constructional steel, is stowed adjacent to them

Each individual coil in the top tier of the stow should be secured by driving wedges between it and its adjacent coils on either side and fore and aft.

Forward compartments

Particular attention should be given to cargo in the forward compartment of a ship where the effects of heavy pitching are more pronounced.

Coils of various dimensions

When coils of various dimensions and weights are offered for shipment, the lighter smaller, coils should be given a top stowage position. Furthermore, precautions should be taken to see that the smaller coils cannot work down too far into the cantlines of the rows of larger coils underneath. If they do so, they may become deformed. There is no objection to overstowing a coil cargo with wire rods, bales or other cargo and whether a floor of dunnage over the stow of coils is necessary will depend on the nature of the overstowing cargo.

Sheet steel in packs

Sheet steel in packs should also be stowed on double lines of athwartships dunnage. The ordinary principles of cargo stowage may be applied to the stowage of these packs. They are not as likely to shift in stow as coils since they stow more compactly.

Dunnage for constructional steel

The customary and recommended method of stowing constructional steel also entails the use of considerable quantities of dunnage. Quantities of timber amounting to between seventy-five and one hundred tonnes per ten thousand tonnes of cargo are quite common. This dunnage, usually 6" x 1" (15cm x 3cm) should be laid in double lines athwartships at intervals along the length of the steel which is stowed fore and aft. The dunnage is inserted to assist in reslinging the steel for discharge and to help bind the steel into a solid block. As the steel is very heavy it needs to be supported at intervals of about 10ft (3m) along its length. Care should be taken to ensure that each line of athwart ships dunnage is vertically over the line immediately beneath it (see Fig 2). If this precaution is not taken the steel may very well become warped. When stowing beams, it is important that the webs are kept vertical and that the flanges overlap in an 'in and out' manner (see Photo 4) as experience has proved that when all flanges are overlapping in the same direction the beams can become severely distorted. The stow should be kept level and complete. Efforts should be made to avoid mixing sizes as this may create gaps in the stow which can later lead to the whole stow collapsing. Athwartships stowage of steel beams should be avoided if at all possible. In particular, try to avoid the ends of beams stowed at the bottom of the hold in a bulk carrier resting against, or

terminating adjacent to, the sides of the hopper tanks in the wings of the compartment. If during the voyage the dunnage compresses, the beams may settle, leaving the ends resting against the hopper tanks and the middle of the beams unsupported. As a result, the beams will probably be permanently bowed (quite apart from the risk of damage to the tanks!).

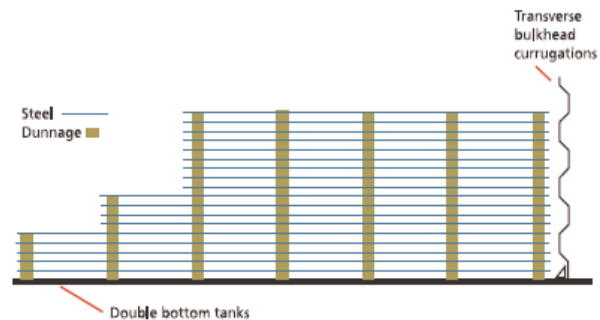


Fig 2. Dunnaging constructional steel

Small section material

Small section material, particularly rods and bars should, wherever possible, be given a top stowage position. They too should be stowed in a fore and aft direction, the stow being kept level to ensure that the material is adequately supported at frequent intervals along its length. Rods and bars should be handled only with rope slings and on no account should crowbars be used in manipulating the bundles into their stowage positions.

Unitised bundles of wire rods are usually stowed in the ship with their axis in a fore and aft direction and in a manner similar to that described for coils. It is not recommended to stow the coils of rod more than, say, six tiers high as the weight on the lower bundles may be excessive. As a result the lower bundles may become deformed and the stow may collapse. As with coils, a two tier stow in part of the hold is preferable to a single tier over the whole floor of the hold. The face or brow of the stow also needs to be fenced or secured in the same way. Loading slings should be made of composition fibre or of wire rope covered with rubber tubing. When forklift trucks are used, the forks should either be covered with timber or fitted with a specially constructed metal tube. One common fault with bundles of wire rod is that if the strapping bands break, or work round the coil to one particular point on the coil, the unsecured turns open out and become crushed, distorted and twisted in the stow.

Reinforcing bars

As far as reinforcing bars are concerned, the bundles should be given good, level stow and should be well supported throughout their length to avoid any bending or distortion which may make them unsuitable for the purpose for which they were intended.

Pipes

Considerable claims have been experienced in the carriage of pipes. They are usually shipped in bundles except where the diameter is very large. In that case, they are usually presented for shipment in single pieces. Special stowage is frequently called for, particularly in the case of lighter pipes, where top stowage is preferred. Where top stowage is preferred, pipes should be stowed fore and aft in the hold. On occasions where pipes have been stowed some fore and aft and some athwartships almost invariably one or other tier has become deformed owing to the weight of the over stowing cargo. These goods are most vulnerable at their ends, and where the ends are threaded then great care should be taken to ensure that the threads are not nicked or otherwise damaged.

Care onboard

Little has been said so far on the all important question of avoiding rust damage to steel cargoes while they are in the ship's care. Every effort should be made to avoid loading (or discharging) during wet weather, and all the hatches should be covered during rain showers. The shippers will frequently object and have been known to bring considerable pressure to bear on a ship's staff to continue loading when the latter have wanted to stop loading during wet weather. Such pressure should be firmly resisted. It is not advisable to continue loading in the rain even if the steel already inside the hatch has been covered with tarpaulins or plastic sheeting, since protection of this type has not been found to be of any great assistance in avoiding rust damage claims. One surveyor reports that within hours of covering a parcel of steel with plastic sheeting, that steel was covered with condensation and rusting had started.

Fact finding on discharge

If damage is suspected on arrival at the discharge port then the master should contact the UK Club's local correspondents direct and ask for the appointment of a competent surveyor to examine the hatches and the stowage of cargo. Contacting the Club's correspondents direct is usually preferable to contacting the ship's agents at the discharging port who may be appointed by, and closely identified with, the cargo interests.

Photographs

Frequently, the receivers of the cargo or the cargo underwriters also appoint surveyors who will want to board the ship and inspect the hatches and other openings into the holds. In the USA, and perhaps elsewhere as well, cargo interests can obtain a court order granting them access to the ship for this purpose. When cargo interests surveyors are onboard the ship they should be accompanied by the shipowner's surveyor wherever they go. The effect of cleverly composed photographs in enhancing the amount of damage apparently suffered by cargo is well known and photographs taken by the cargo interests surveyor should,

if possible, be countered with photographs taken by the shipowners' surveyor showing the overall condition of the cargo. A responsible person should always be on duty at or near the gangway at all times to prevent unauthorised people boarding the ship.

Sea water entry or condensation?

Sometimes, on opening hatches, a pattern of rust extending right down through the stow coinciding with the hatch coamings or hatch joints is discovered. This may indicate that the hatches have leaked during the voyage;

it may on the other hand be indicative simply of heavy condensation. In any event it is imperative that the pattern of damage in each compartment is accurately noted for only in this way will it be possible to distinguish between pre-shipment damage and damage incurred during the course of the voyage.

A careful examination should be made of any rust which is not pre-shipment in origin to establish whether it is caused by sea water or fresh water. An experienced surveyor should normally be able to say, fairly conclusively, which is which without resorting to silver nitrate tests, which can be quite misleading.

Stevedore damage

Any further damage caused by the discharging stevedores should also be noted so that recovery can be made from them for any claims that may be lodged for physical damage to the cargo caused by them.

Conclusions

The interests of the shipowner and the charterer are parallel, or should be. Both will be involved in any claims that arise and by persistently delivering damaged cargo the charterer may lose business.

We would again emphasise that when wrapped steel products, e.g. cold rolled material, tin plate, etc, which are highly susceptible to moisture damage, are being loaded and rain threatens, or becomes a reality, loading should be stopped and the hatches covered. With unwrapped hot rolled material fresh water exposure over a limited period should have no adverse effects, but some discretion should still be exercised as prolonged rain could result in large quantities of water collecting on the ship's tank tops. As a consequence, a cargo could stand in salty or brackish water for a significant period and the humidity levels in the holds could be increased. The dead-weight nature of steel cargoes causes the ship's structure to work more heavily in high seas and the maintenance and securing of the hatchcovers could be critical. In this respect we refer readers to the article on steel hatchcovers.