

# Carefully to Carry

AUGUST 2016

## Carriage of bagged rice

*Rice is a cereal grain and the staple food for many nations across the planet and can be grown in anything from dry upland soils, to irrigated fields and along flooded river beds.*

There are over 85,000 varieties of rice in the research stocks of the International Rice Research Institute (IRRI), and there are over 120,000 cultivars known to exist. The most common, Asian rice (*Oryza Sativa*), is divided into Indica and Japonicas categories, the first is longer and more slender, and generally remains separate when cooked. Japonicas have shorter, rounder and more translucent grains, which quickly become slightly sticky.

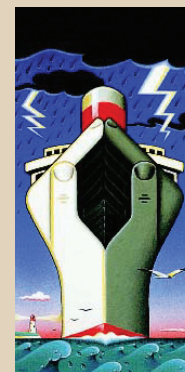
When harvested, rice typically contains moisture in the range 15-22% (US) or 19-25% (Asian) and therefore, must be dried to prevent spoilage (generally 12-14.5%). If well dried and protected, rice can be stored for many years. After being dried and stored, the rice undergoes a milling process, which removes the tough outer husk and inner layers of bran from the edible rice grain. The difference between brown and white rice being only how much of the bran is removed.

Rice is traded as either paddy or milled rice, but most rice moving in world trade is fully milled and bagged in 20, 25 or 50kg polypropylene bags. In any event, a description of the product is required in cargo documentation i.e. paddy/brown/milled/parboiled. Other details needed are grain type (long or short), origin and the percentage of broken rice (e.g. Thai white rice, long grain, 5% broken). Standards in most countries define the percentage of "brokens" and other imperfections allowed in each grade of rice, and the basis on which such percentages are measured – all of which have an impact on market value.

There are countries that are both major producers and consumers of rice, with some 479 million tonnes produced in the 2013/14 season<sup>1</sup>. Whilst most of the rice produced and milled is for the domestic market, there remains a significant amount to be traded internationally with 38 million tonnes transported across borders in the 2013/14 season<sup>2</sup> with India, Thailand, Vietnam and Pakistan being the largest exporters.

<sup>1</sup> [www.airea.net/page/65/statistical-data/world-rice-production-consumption-and-stocks](http://www.airea.net/page/65/statistical-data/world-rice-production-consumption-and-stocks)

<sup>2</sup> [www.airea.net/page/55/statistical-data/world-rice-trade](http://www.airea.net/page/55/statistical-data/world-rice-trade)



**"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](http://www.ukpandi.com) for more information, or contact the Loss Prevention Department.

Traditionally, this cargo would have been carried as breakbulk onboard general cargo ships designed to accommodate their transport with permanent wooden dunnage and spaces designed for proper ventilation to ensure the cargo arrived in the best condition possible. However, as global demand for staple foods has risen and the shipping industry has faced increasing pressure on freight rates, a large percentage of rice shipments are transported in bagged form aboard traditional bulk carriers with smaller parcels carried more and more often as containerised cargo.

## Hazards to cargo

Aside from issues of pilferage at the loading or discharge port, the primary hazards to bagged rice are water damage, infestation, mishandling of cargo bags during loading, improper stowage in cargo holds and deficiencies in the ship's condition affecting the cargo holds.

Bagged rice needs to be kept dry and well ventilated. Therefore, it is important to inspect the ship's holds, hatch covers and ventilation system for potential defects as these will be critical to the safe carriage of the cargo, even on short voyages.

### Sea water ingress

Ingress through the cargo hatch covers on passage, bilges, hull damage, pierced ballast tanks or through sounding pipes in cargo holds.

### Fresh water ingress

Rain ingress during loading or discharging operations, or through leakage on passage. Damaged pipework within cargo hold. Ship/cargo sweat due to variations in climate temperature and humidity (see below).

### Condensation

Fresh water condensation on the ship's structure or cargo caused by temperature differences between the air in the hold and the ship's steel structure (or cargo) from poorly managed ventilation.

### Contamination

Cargo holds can be "contaminated" from prior cargoes carried in the hold or cargo (residual odours, staining), by general condition (rust, chipped paint) or from fuel leakage.

### Infestation

Rice is particularly susceptible to being infested with storage pests if stored for over two months. Cargo can be exposed to granary and rice weevils, flour, drugstore and spider beetles, as well as for dried fruit and meal moths, rats and mice. The chewing damage caused by cereal pests also brings about increased heat and

moisture, which in turn provides favourable living conditions for mould and (potentially) bacterial growth.

### Heat

As well as the danger of direct heating from halogen lamps that have not been isolated, heat may be generated from spaces adjacent to cargo holds such as heated bunker tanks, the engine room or adjacent cargo.

### Improper stowage

Damage to bagged rice can occur due to improper stowage, shifting or cargo stacks collapsing during transit.

## Cargo damage

The frequency and costs of claims associated with bagged rice is significant, with wet damage generally accounting for over a third of cargo claims and nearly half of the associated costs. Handling damages generally account for one fifth of the claims. It is also notable that cargo shortage claims, attributed to short landings and pilferage, are one of the most costly claim types.

### Caking, wet rice and mould

Seawater/freshwater ingress or condensation can cause the rice in the bags to become wet and permanently damaged through "caking", and can also result in mould development. Affected bags have almost no salvage value.

### Odour contamination

Wet rice, particularly rice damaged by seawater, spreads a penetrating odour, which is absorbed by the adjacent rice and may spread through the entire hold. Rice is highly odour-sensitive. Brown rice is particularly sensitive to the absorption of foreign odours. Affected cargo has almost no salvage value.

### Torn bags

Bags used to carry rice are normally constructed from woven polypropylene, which is a relatively strong material but nevertheless, subject to tearing and damage during loading, transit or discharge handlings. Rice from damaged bags can be restowed in spares but this increases handling costs and can lead to shortage claims.

### Stained bags

Bags can be stained due to contact with dirty surfaces or other factors as above. If the rice is undamaged, it may be re-bagged but will face devaluation and incur additional costs for handling.

## Damage avoidance: preparation

### Cleaning

The condition of the cargo holds can be affected by a number of contributing factors that make it unsuitable for carrying bagged rice. The following proper precautions should be taken in preparing the cargo hold before loading:

If there is any sign of previous insect or rodent infestation, holds should be sealed and fumigated using an approved method or, if appropriate, sprayed locally with insecticide. Such operation should only be performed by approved professionals with due regard held to the safety of the crew and contractors.

Rust and scale which might contaminate the cargo should be removed. Paint and lime wash may be applied to avoid the direct contact of scaled ship side with the bagged rice and also provide a sound and hygienic space to carry cargo.

Cargo holds should be properly cleaned and prepared: all tanktops/decks and bulkheads (including all difficult to reach areas and areas where dirt and water may become trapped) should be cleaned, swept, washed, rinsed with fresh water, mopped, well ventilated and dried.

All the residual odours from cleaning agents should be thoroughly ventilated from the space as they may taint the bagged rice.

The hold bilge wells should be clean and free from cargo residue, bilge water or moisture. Hold bilge suction and non-return arrangements should be tested and demonstrated as functional. Double burlap wrapping should be applied on the bilge cover plate with masking tape.

### Hatches and vents

Bagged rice needs to be kept dry and well ventilated. Therefore, it is important to inspect both the ship's cargo hatch cover systems and ventilators for potential defects as their performance will be critical to the safe carriage of the rice cargo.

- Hatch covers operation should be reliable, safe and timely in order to close them to protect from rain during load or discharge. Hydraulics should be free of leaks that may taint cargo.
- Cargo hatches should be free of piercing damage or deformation, correctly aligned and meet adjoining covers and coamings squarely. The compression bar, dogs, clamps and cleats must be in line and free of deformation to operate correctly. Dogs should be clear of damage and set for the correct tension when applied.

- Hatch cover packing should be in good condition (i.e. not be imprinted by more than 25%, hardened or any sections missing). Replacement packing should be made in complete lengths only, and pre-shaped corner sections used where necessary. Packing channels should be clear of corrosion and free of damage or deformation.
- The full weight of the hatch covers is not supposed to be borne by the gaskets alone: hatch cover landing pads should have minimal wear to avoid over-compression of the packings.
- Drainage channels are to be clear of corrosion and free of damage or deformation and drain non-return valves should be checked and proven to be operational.
- Ventilator flaps should be inspected to ensure that they in good working condition and properly seal when closed.
- The double bottom ballast tanks and side tanks should be pressed up prior to loading to ensure their watertight integrity.
- Bilge suction and tank top openings should be thoroughly examined, tested and proved fully operational and the strainer plate over-covered with burlap (see above). Any openings to the tank top should be examined and proven to be water tight and properly secured.
- Sounding pipes and other pipework should be examined and cleared of any debris. Any pipes within the holds, including ballast pipes or tank air pipes should also be closely examined to ensure they are in good working condition. Sounding pipe closures should be checked to ensure that they are watertight.

It is the shipowner's responsibility to maintain their cargo hatch covers in good operable condition and establish an adequate inspection/maintenance program, so that due diligence may be proven in the event of any cargo claim. It is therefore also the shipowner's burden, to prove that their cargo hatch covers are in "good" operable condition.

Hatch covers should be proven to be watertight by hose test or, preferably, ultra-sonic testing carried out independently prior to loading of cargo. Holding valid class and flag certificates alone will be no defence against a water ingress claim.

*It is important to note if charterers ask to use Ramnek tape, it does not relieve the shipowner from their duty under the charter party to present their ship in seaworthy and cargoworthy condition.*

## Dunnage

In order to prevent damage from condensation, dunnage should be used on steel surfaces. Individual country or port authorities may have rules on the use of specific types of dunnage, and local agents should be consulted in advance to determine if there are any local restrictions but, generally, there are two primary types of dunnage used for bagged rice transported on bulk carriers: bamboo or timber. Additionally, a combination of Styrofoam, plastic/polythene sheet and craft paper is being pioneered by Allied Maritime Inc.

### Bamboo dunnage

It is been practice in some ports to use bamboo mats and sticks in the belief that they provide the best possible protection. Dunnage usually consists of bamboo sticks laid in a crisscross fashion on the steel tank tops and side shells, and then overlaid with bamboo mats.

Whilst bamboo is lightweight, re-useable and relatively cheap and easy to access in loading ports, it is not usually moisture-free and can retain and bleed moisture during passage. Bamboo sticks may appear dry on the outside but may have a moist pulpy interior. Bamboo mats overlaid by craft paper should never be used, as the fragile craft paper will be destroyed and rendered useless.

The results appear to show that when there is condensation or wetness on the tanktop, bamboo mats tend to absorb the moisture and pass the moisture onto adjacent bags that rest upon them. The greater the condensation: the further damage transferred to more adjacent bags. We recommend the avoidance of this methodology.

It is worth noting that Peru does not allow cargo protected by bamboo mats and sticks to be discharged

at their ports. A similar restriction applies in Chile, in the sense that disposal of protection materials such as bamboo mats and sticks are not allowed.

### Timber dunnage

Timber dunnage (thick planks) should be placed in two layers on the tanktop of each hold. The lowest layer in a fore aft direction, to provide drain channels, and the second layer at 90°. This will prevent the lower tiers of bags coming in to contact with the tank top and avoid wet damage to cargo. The timber dunnage should be well cured, dried and the use of fresh sawn timber should be avoided. Craft/lining paper or corrugated cardboard should be placed on top of the timber dunnage to protect the bags.

In tall or partial loads, timber dunnage should also be used within the stow to avoid stow collapse.

### Allied Maritime approach

The proper placement and combination of plastic/Styrofoam dunnage materials has proven to be effective in reducing condensation damage on bagged rice from condensation damage caused by direct contact with ship's steel structure.

Styrofoam is not always an easily obtainable product in many ports, and can be expensive. In addition, plastic and Styrofoam dunnage materials may be difficult to dispose of at some ports. Furthermore, proper care is required that the stow does not become closed off by polythene sheeting material, reducing the ventilation capacity through the stow or blocking drainage of any condensation.

*Caution should be taken using Styrofoam near ventilation openings: it should be carefully cut and fitted so it does not prohibit the flow of air through the ventilation openings.*

Location	Plastic sheet	Styrofoam	Craft paper	Optimal arrangement	Alternative arrangement
Sideshell	X	X	X	Plastic and Styrofoam	Plastic and craft paper
Forward bulkhead, cargo hold No.1	X	X	X	Plastic and Styrofoam	Plastic and craft paper
Aft bulkhead adjacent to engine room	X	X		Plastic and Styrofoam	Plastic and craft paper
All other transverse bulkheads	X		X	Plastic and craft paper	Craft paper
Hopper tanks	X		X	Plastic and craft paper	Plastic or craft paper
Hatchways	X	X	x	Plastic and Styrofoam	Plastic and craft paper
Hatch coamings	X	X		Plastic and Styrofoam	Plastic or Styrofoam
Tank tops and tank top sloping plates	X		X	Plastic and craft paper	Plastic or craft paper
On top of cargo			X	Craft paper	



## Damage avoidance: stowage and ventilation

Rice should not be stowed near any strong smelling cargo such as bagged cocoa, bulk copra or similar. Due regard to taint should be taken when finalising a cargo stowage plan with multiple cargoes in adjacent spaces, and any impact ventilation exhaust may have.

Stevedores hired to load cargo are usually contracted by the shipper and/or charterers. In many load ports, stevedores may be unskilled workers that are poorly paid for their work, and therefore, safe stowage, effective dunnaging and building of ventilation channels in the stow may not be a priority. Consequently, shipowners should do their best to encourage charterers to hire qualified and experienced stevedores to arrange and lay appropriate dunnage to reduce the possibility of stowage related problems.

Shipowners, in coordination with the ship's master and chief officer, should be made aware of the charterer's stowage plan (in writing) in advance of cargo loading operations, and all efforts made to ensure the cargo is stowed as per the agreed charterer's/shipper's instructions.

With this in mind, the construction of ventilation channels should be considered on a case-by-case basis depending upon the volume of cargo, dimensions and configuration of the cargo holds and the ventilation capabilities of the ship to allow the free flow of air. It is a common practice that every five tiers of cargo being stowed should interlock and cross bags between adjacent stowage stacks. This practice will allow for better stability of the stacks to prevent cargo stack slippage that could potentially block ventilation channels.

### When to ventilate (subject to charterers' orders and fumigation instructions)

Bagged rice must be properly ventilated to prevent condensation during the voyage, and indeed, at any point when the hatch covers are shut. The purpose of this is to remove the warm, moist air surrounding the cargo and replace it with drier air to minimise condensation on the colder steelwork in the hold: known as "ship's sweat". To do this the ventilation method must be effective and the environmental conditions must be right.

The scientific rule is that if the dew point of the outside air (the air used for ventilation) is lower than that in the hold, then it is appropriate to ventilate and, if not, ventilation should be withheld. However, it may be necessary to ventilate for other reasons such as fumigators' instructions when the cargo has been fumigated onboard. External factors, such as sea spray

across the ventilator openings must also be taken into account to ensure that water does not enter the hold.

While the ship is on passage, the dew point should be regularly monitored in order to determine if ventilation of the cargo holds is necessary. Comparison of dew points is usually made by taking readings from wet and dry bulb thermometers on deck and in the hold.

Obtaining the ambient readings is generally easy as most ships have a Stevenson screen fitted on each bridge wing. However, obtaining the same readings in a ship's hold can be problematic during the voyage; it may not be safe for the ship's personnel to enter the hold to obtain temperature readings, and if thermometers are simply lowered into the hold from outside, it will be difficult to obtain sufficient air flow across the wet thermometer.

Where it is possible to safely enter cargo holds to obtain meaningful readings, it may be necessary to stop ventilation to allow the in-hold atmosphere to stabilise. If this is not done, the crew will be measuring the ventilating air rather than the true in-hold atmosphere. If a reading is taken it should be properly recorded in the *Cargo Ventilation Record Book*.

Where access to the holds is impossible or undesirable, and provided there is no significant air flow, the hold dew point can be determined from traditional wet and dry bulb thermometers placed inside the trunking of an exhaust ventilator or similar pipework leading from the compartment. Again, if this is done, it should be properly noted in the *Cargo Ventilation Record Book*.

In many instances, it is impracticable to measure hold dew point temperatures accurately. At these times it is recommended that the "3° Rule" be applied. Whilst this is a rule of thumb, it essentially relies on the same principles as the dew point rule, but it will be necessary for the ship's staff to take a number of cargo temperature readings during loading.

**Ship sweat** occurs when a ship loads in a warm, moist atmosphere, and then sails into cooler climates. As the ship's steelwork cools below the "dew point" of the surrounding air, moisture will condense onto it. Ship sweat appears as beads of moisture, typically on the sides of the hold when the sea temperature is low or on upper sides when the air temperature is cold.

**Dew point** is the temperature at which a parcel of air loses its ability to hold the moisture it contains, and should not be confused with relative humidity. In a nutshell, warm air can hold more moisture than cold air, and the more moisture warm air holds, the more condensation it will produce when cooled.

## Ventilation systems

There are three systems of ventilation of shipboard cargoes that are in general use, mechanical (air flow assisted by fans), natural (without fans) and a controlled atmosphere (controlling a space's temperature and carbon dioxide).

It should be noted that most ships loading full cargoes of rice in the short sea trade, in locations such as Thailand, generally have only natural ventilation, sometimes assisted by portable fans. For voyages to colder climatic regions, natural ventilation is insufficient, and any ships engaged on carriage of bagged rice on longer voyages should be equipped with a proper functioning mechanical ventilation system, with a capacity of between 15-25 air changes per hour (calculated on the basis of empty hold space). Furthermore, all fans need to be checked that they run properly in the correct direction. The carriage of rice in a controlled atmosphere ship does not provide any advantage over a well-ventilated space.

*In cases where the cargo has been fumigated, on no account should crew members enter the cargo holds until they have been appropriately ventilated and certified gas-free.*

## Fumigation

Most rice cargoes are fumigated after loading is completed. This operation brings its own set of challenges as that which kills insects may just as easily kill humans.

Foremost, due regard should be paid to the IMO's *Recommendations on the Safe Use of Pesticides in Ships Applicable to the Fumigation of Cargo Holds* (MSC.1/Circ.1264 and amendments).

The fumigation process starts with a survey by the fumigator, prior to loading. The surveyor will inspect the cargo holds looking for any area that will allow a fumigant to penetrate into spaces that will be inhabited by the ship's crew. This is especially important at the bulkheads between the accommodation spaces or machinery spaces and cargo holds. If any are known or found, the surveyor will recommend that it is properly and effectively sealed off.

Before the fumigant is applied, the seals on the hatch covers and access trunkways must be marked with warning signs, and sealed once completed.

The most common fumigant used is phostoxin (aluminium phosphide), which creates phosphine gas when it reacts with moisture in the air: for it to activate

there has to be sufficient moisture in the air and the temperature of the grain must be greater than 7°C.

Tablets of phostoxin are often placed in sleeves that are laid across the surface of the cargo. The sleeves place all of the phostoxin in a sock-like tube so that the residual ash can be easily removed at the discharge port. If these sleeves are not properly applied, this can result in an incomplete reaction, with an insufficient dose applied to the cargo and the danger of phosphine gas produced when it is disturbed at the discharge port. A preferred (but more expensive) version is the pre-pack rope, which spreads the tablets out in a rope-like container across the top of the stow. This ensures greater exposure and thus, better reactivity.

The recommended minimum dosage of phostoxin is 33grams per 1000ft<sup>3</sup> of space. An effective dose is normally 45g/1000ft<sup>3</sup>. In some instances, owners and/or P&I clubs have hired independent surveyors to witness the fumigation process.

Whilst known to produce a "quick kill", methyl bromide is banned in many countries and is on the verge of being banned worldwide due to its impact on the environment. Additionally, unlike phostoxin, which is produced with a warning agent, methyl bromide is colourless and odourless and can easily kill humans at low doses. When it is used, the ship should be evacuated for the duration, thus, it is never a choice for fumigation on passage.

### CASE STUDY

A small hold fire occurred on a ship with a cargo of bagged rice. Investigation showed that only empty rice bags had combusted. It was found that, as is customary, a few thousand empty polypropylene bags had been loaded on top of the cargo on completion of loading to allow for rice from spilt or broken bags to be repackaged during discharge.

From the available evidence it was deduced that the person doing the fumigation triggered the solid fumigant capsules and threw them onto the cargo from the hold access hatch. One or more of the capsules must have landed on top of the empty bags, which were determined to have been wet and the additional moisture accelerated the chemical reaction, thus creating excess heat and causing the fire.

As the hold's fire/smoke detection systems had been isolated as required prior to the fumigation, the ship's crew were unaware that there had been a fire in this hold for some days after departure. And it was allowed to smoulder for some time.

Empty bags must be loaded in a clean and dry condition.

For a charterer, fumigation is usually applied only because it is required in the sales contract and it can therefore be a temptation for the shipper to ask a fumigator for a “full certificate” whilst only applying a cursory fumigation with less than the required dose for the size of hold – this should be monitored closely and the details of what is applied recorded.

## Protection from claims

Some of the damages as specified earlier, can occur to bagged rice prior to arrival onboard ship and it is important to recognise and document any pre-shipment irregularities prior to accepting it onboard.

In particular, cargo can be exposed to wetness damage during any possible barge leg of a voyage due to water ingress via the barge hull planking from older wooden barges or via the deck/hatch cover arrangements of both steel and wooden barges. This is a particular problem during inclement weather and must be well attended: as well as the condition of the cargo, investigation of the condition of the barge should be well documented.

Bagged rice is normally brought aboard ship from barge or from ashore pre-bundled via crane. Bundles should be initially examined for any visible damage as much as possible before delivery into the hold and afterwards, during stowage.

## Cargo quality and moisture content

The ship's master and chief officer should ensure that the cargo is tested for moisture content as it arrives onboard. The maximum moisture content for rice to be shipped is 14.5%. If the cargo moisture is found to be in excess of that amount, there is a significantly higher risk of damage resulting from condensation.

It is important to acquire cargo quality certificates from the shippers. However, their results should not be solely relied upon. Consequently, the master should approach the Managers for advice and acquire the assistance of the local Club correspondent to assist.

### During loading and discharge:

Shipowners should have procedures for tasks to be performed during inclement weather during cargo operations for monitoring of weather conditions that allows sufficient time to fully close the cargo hatch covers to prevent damage to the bagged rice.

When the cargo hatch covers are open, the cargo holds are exposed to potential adverse weather conditions. The master should ensure that during loading and discharge operations, that there are crew

members on station on the bridge that are constantly monitoring any changes in weather that may require the closing of the cargo hatch covers (by visual observation, radar and from appropriate rain forecasts). Rainletters must not be accepted.

As well as ensuring hatch covers are in good working order, the crew should know the amount of time it takes to close each and every hatch cover prior to commencement of cargo operations. Adequately sized, placed and secured tarpaulins should be considered as an additional measure of cargo protection that can cover closed or partially closed hatches in the event of adverse weather conditions.

Whilst unlikely, the same applies if cargo hatches are opened during the voyage to ventilate the cargo.

## Third party surveyors

In order to protect the ship from false claims, sometimes it might be useful to utilise qualified third party surveyors to properly corroborate and record the condition of the ship, cargo and conduct of the operations. The crew should regularly monitor and ensure that surveyors are performing their assigned survey tasks as required.

An inspection should be made to document the condition of the cargo holds prior to loading to ensure that they are dry and clean, that bilges are in satisfactory condition, ventilation systems are in working order and the hatch covers are in satisfactory weather-tight condition. If possible, an ultra-sonic hatch test should be witnessed and reported by the attending surveyor.

- A tally surveyor should be positioned at each cargo hold to record the quantity of bags loaded and to liaise with tally clerks representing the shipper's interests to agree on the quantity that will ultimately be noted on the Mate's Receipt.
- Where a draught survey is required (and allowed), surveyors representing shipowner and shipper's interests should jointly carry this out before and after loading to agree on the quantity of cargo loaded. It should be noted that the weight of cargo may decrease as a result of loss of moisture from the cargo during the voyage and as such, the moisture content of the rice should also be taken at load and discharge.
- A cargo surveyor should monitor the cargo being loaded to ensure that it is properly stowed with due consideration to dunnaging and unobstructed ventilation, with sufficient and proper ventilation channels and with a stable stow.

- A cargo surveyor should monitor the condition of the cargo as it comes onboard and during its handling by stevedores in order to reject, on behalf of the shipowner, any bags that are caked, mouldy, wet, torn, stained, discoloured or odour contaminated and reject/remark entire lots that appear to be infested by vermin.

## Stevedore monitoring

During loading and discharge operations, the crew should be aware of the particular tasks of and risks associated with stevedores:

- rough handling of rice cargo bags leading to tearing;
- use of steel hooks for cargo handling (which should be strictly prohibited);
- the loading of heavy slings of bagged rice should be monitored to ensure that cargo is properly lowered and lifted as this can cause damage, which often goes undetected until discharge;
- dragging cargo that is wedged in or over-stowed by other cargo, is to be avoided by managing the load and discharge sequence;
- improper stowage that prevents proper cargo ventilation;
- theft/pilferage; and
- urination and defecation in cargo hold areas due to lack of sufficient sanitary facilities for stevedores while working onboard the ship.

As well as manning the gangway (and therefore, monitoring any pilferage), if cargo/tally surveyors are not available, the master should consider stationing crew members above every cargo hold where cargo operations are underway to monitor the activities of all stevedores working in the cargo holds, and any other locations where cargo is being brought aboard or discharged from the ship where stevedores are involved in the cargo operations.

## Recording

In the event of damage or incidents, the crew should:

- notify the Master and/or officer on watch of any and all observed activities of concern by third parties aboard ship while loading and discharging of cargo;
- log the details of the specific incident in the ship's cargo logbook;
- collect all possible relevant evidence (video, photographs, statements from witnesses and physical evidence of the incident, if applicable) as practicable to be kept as a record of the incident.

The Mate's Receipt should reflect the details of the exact condition of the cargo, any pilferage/theft, receiving of damaged bagged rice upon loading (i.e. prior to arriving aboard ship); improper stowage of cargoes, etc. Any remarks concerning visual damage should be noted on the Mate's Receipts: for example, "2 torn bags", "5 discoloured bags", "3 mouldy bags", "evidence of infestation".

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## THE AUTHOR

*Nick Dowden, a Marine Surveyor with BMT Surveys, is a Master Mariner with a seafaring career spanning 15 years. He has experience on a wide range of vessels including feeder, geared and fifth generation container ships, survey vessels, general cargo ships, VLCCs, offshore vessels as well as sail training ships. As well as his certificate of competency, Nick holds an honours degree in Shipping Operations, post graduate certification and a range of specialist training qualifications for the offshore industry, including certification as an IMCA registered surveyor. He is an associate fellow of the Nautical Institute and a Freeman of the Honourable Company of Master Mariners.*

