TRANSPORTATION OF CEMENT

Cement cargoes, which account for about 5% of the dry bulk trade, can prove to be extremely problematic when carried in conventional bulk carriers as opposed to specialized cement carriers. If not dealt with in an appropriate manner, cement carriage can result in cleaning expenses of over USD 100,000 and delay the vessel for a significant period of time.



LOSS PREVENTION

BEFORE LOADING

The main problems with cement cargo arise when holds are not initially dry, clean and watertight. The majority of claims arising from cement cargo are caused by the following factors

- → Solidification when wet
- → Contamination by residues of previous cargoes
- → Retention of heat when loaded warm

Packaging:

- → Cement, if not carried in bulk, is usually shipped in 50 kg paper bags or one/two tonne polypropylene bags.
- → These must be further packaged in water-proof material as absorption of moisture or carbon dioxide from the air can significantly deteriorate cement over time.
- The deterioration may not be visible but it significantly reduces its performance.



Solidification

- It is crucial to ensure all holds and bilges are completely dry prior to loading.
- → It is also of paramount importance that all valves in the drain and bilge systems are thoroughly checked and confirmed to be operational. Dysfunctional valves can allow water to seep into holds through the bilge line system causing the cement in the holds to solidify.
- An ultrasonic test before loading must be conducted in order to ensure the hatch covers are weather tight. The ultrasonic test saves a lot of trouble in comparison with other conventional methods (hose test, chalk test) of checking weather-tight ness and has become the international standard in recent years. If seawater leaks though the hatch covers, the cement can harden and result in damage to the vessel, unloading equipment, loss of cargo, additional removal work and possible damages to the terminal.





Cargo in good condition



Relatively inexpensive, hand held infrared thermometers are ideal to scan the surface of the cargo prior to and during loading and quickly inform the master if temperatures are of concern.

Contamination

- → Cargo holds must be clean and odour-free.
- → It must be clarified in the charterparty what level of cleanliness is required on delivery and an independent surveyor can be employed to make sure the vessel is ready to load cement.
- → Cargo residues such as sugar and fertilizers may result in the contamination of cement cargoes. Raw sugar reacts with cement and even small amounts seriously affect the setting and hardening performance of cement. As little as 0.001% of sugar, if mixed with cement, renders it worthless. Some cement companies do not allow cement to be carried on vessels which have carried previous sugar cargoes.





Cargo with temperatures of over 100°C must be allowed to cool down before the commencement of loading.

Temperature

- → It is important to check the temperature of cement before loading, as its temperature can be as high as 110°C when leaving the production site. This should especially be considered when loading takes place alongside the factory and cargo is loaded as soon as it is passed through the kilns.
- → Loading cement at high temperatures (over 100°C), not only damages hold coatings, but also leads to the production of water vapour within the holds.
- → Conducting pre-loading surveys to ensure all cargo is below 100°C can prevent cargo and vessel damage
- → When incoming air has a lower temperature than the cargo in the holds, the surrounding air cools and produces vapour which



 \rightarrow

condenses. This results in the solidification of cement in the cargo holds. The wet cement dries in the holds and hardens, leading to troublesome cleaning problems.

- → Good ventilation can reduce the occurrence of this, but only when the weather is not extremely humid.
- → The temperature can also be raised and the cargo damaged due to heat transfer from the Double Bottom Fuel Oil Tanks. High viscosity, low quality, heavy fuel oil is unpumpable at low temperatures and so heating of the oil becomes necessary. The number of tanks varies depending on the type of vessel, but generally these fuel tanks are located only underneath holds 5, 6 and 7. When the fuel is overheated, the heat is transferred to the plating above the tanks to the holds. The extent of damage varies with the moisture content of the cargo and the duration of the heating. A common cause of this problem is the lack of communication between the Engine and Deck

Departments. The Engine Department often does not understand the nature of the cargo loaded on the vessel and thus do not consider the effect of overheating the fuel oil. Another common cause of overheating of fuel oil is the incorrect operation and poor maintenance of steam values, which if not completely closed result in a continuous flow of steam through the heating lines, leading to unnecessary prolonged heating.

Precautions

There exist special chemicals that may be applied to the cargo holds before loading that serve to protect the surface from the cargo and subsequent cleaning processes. However, these chemicals must be applied according to the manufacturer's recommendations as they may prove to be difficult to remove and cause problems when the holds are repainted.



Wet cargo, due to rain, must be separated from sound cargo before the commencement of loading



The loading process into holds results in the creation of large amounts of cement dust settling on all exposed areas. All areas must be swept and/ or washed down after the completion of loading to prevent loose cement from hardening if exposed to seawater or rainwater during the vessel's journey



Before loading



After loading



DURING LOADING

- → If it is warm and humid at the port of loading, hatch covers should be closed as soon as loading has been completed to retain dry air inside the holds.
- → Hatch covers should also be kept closed during intervals in loading, especially if there is a possibility of rain.

Closed loading systems

- → Closed loading systems entail pumping cargo under high pressure into the holds through a loading chute, while the hold covers remain closed.
- → When loading cement in this manner it could result in a large amount of cement dust sticking to the hatch cover undersides, hatch trackways, hatch coamings, drain holes and drain channels. Incorrect loading equipment could worsen the situation. If this cement dust is not cleaned, it would harden and result in the blockage of the drain holes and channels on coming into contact with rainwater or seawater during the vessel's journey.

AFTER LOADING, BUT BEFORE DEPARTURE

- → The main deck, hatch covers, hatch coamings, drain holes and draining channels should be swept and washed down before departure of the vessel.
- \rightarrow If not forbidden by the port due to anti-pollution regulations, these areas should be cleaned with compressed air.
- → This prevents any loose cement in these areas from hardening if exposed to water.

During discharge

- → Discharge should not be undertaken during periods of bad weather.
- → Charterers may be asked for a LOI if they insist on discharge. This would usually serve to place all liability and damage risks on

charterers.

→ If charterers have CLH cover, that could be prejudiced by the terms of the LOI.

After discharge

- → After discharge, dry residue and pockets of cement remain loosely adhered to exposed surfaces in the hold, including bilge wells, cargo hold bulkheads, hatch cover undersides and hatch coamings.
- → The cement dust in these areas should be cleaned using brooms, brushes and air guns with the help of Cherry Pickers. When all cement dust has been swept away, all areas should be washed with seawater using high pressure hoses (2,500 psi).
- → If there is semi-hardened cement visible on the hold surfaces, a more aggressive approach should be employed from the start. Stiff bristle brushes and hand scrapers should be used to remove as much as the cement as possible. If hardened, pressure hoses will not successfully remove the cement and only worsen the situation. Water will aid in the hardening process of the cement, causing more damage and further delaying the cleaning process
- → If manually sweeping and scraping the surface does not remove the hardened cement, additional equipment such as very high pressure washers (20,000 psi) may have to be loaded on board. These are expensive, extremely heavy and cause delay.
- → If the hard residues can still not be removed by high pressure water/air, it may become necessary to remove the hardened cement with acid cleaners or specialized machines. The acid may cause damage to the hold paint and thus must be diluted with freshwater. Check the hold paint manufacturer's recommendation as to which acid cleaners they suggest be used. Acid cleaners must be used with great precaution as they can cause harm to the cleaning crew. Material Safety Data Sheets should always be consulted.





Source: bulkcarrierguide.com





Cement dust loosely adhered to exposed surfaces in the holds that must be swept away after discharge.



20,000 psi pressure washers are extremely costly and can weigh as much as 4000 kg Source: www.ultimatewasher.com



CONTRACTUAL OBLIGATIONS

HOLD CLEANLINESS ON DELIVERY

Most charterparties provide for the vessel's holds to be clean-swept on delivery.

CEMENT VOY - Clause 6

"At loading port before tendering notice of readiness, the Owners and the Master shall ensure that the Vessel's holds are clean and dry and in all respects suitable to receive the cargo.

If, after tendering of notice, the Vessel is nevertheless found by the Charterers' Surveyors not to be clean and dry, the time from the Vessel being found not to be clean and dry until she is in fact clean and dry shall not count as laytime or, if the Vessel is already on demurrage, as time on demurrage. The Owners shall be responsible for unavoidable standby charges for trucks, railcars, barges and gangs incurred directly due to the resulting delay in loading.

If, in the Owners' opinion, acceptance of the holds is unreasonably withheld, the parties shall appoint jointly an independent Surveyor whose decision shall be final."

NYPE '93 form

"The vessel on her delivery shall be ready to receive cargo with clean-swept holds and tight, staunch, strong and in every way fitted for ordinary cargo service, having water ballast and with sufficient power to operate all cargohandling gear simultaneously."

It is important to remember, however, that this obligation of owners does not usually extend to subsequent loading ports. Charterers must clearly specify the degree of cleanliness required in the charterparty, as once accepted at the time of delivery, charterers cannot reject an 'unclean vessel' at a subsequent loading port. The case – The Bunga Saga Lima [2005] 2 Lloyd's Rep. 1 – makes this clear.

INTERMEDIATE HOLD CLEANING

Owners do not have an obligation to warrant clean holds at every load port subsequent to the port of delivery. However, some charterparties contain express intermediate hold cleaning and/or customary assistance clauses, which oblige the crew to undertake the cleaning of holds in preparation of the next cargo.

NYPE '93 – clause 8

a) The Master shall perform the voyages with due dispatch, and shall render all customary assistance with the Vessel's crew.

NYPE '93 – clause 36

"The Charterers shall provide and pay extra for sweeping and/or washing and/or cleaning of holds between voy-



In connection with any such operation, the Owners shall not be responsible if the Vessel's holds are not accepted or passed by the port or any other authority.

It is important to remember that the crew are not skilled cleaning operatives and charterers are expected to know when fixing, what cargoes the vessel can carry consecutively without the need of specialized intermediate cleaning. The extent to which a particular service is customary or not will depend on the facts and circumstances, but with regard to hold cleaning there are limits to what the crew can be expected to do. The English High Court case, The Bela Krajina [1975] 1 Lloyd's Rep. 139, dictates that professional cleaning services requiring specialized training and equipment should not be expected of the crew.

In addition, the intermediate hold cleaning clauses in a charterparty must be specific. The extent of the intermediate hold cleaning by the crew will depend on the construction of the clause in the charterparty. The charterparty must specifically state the cleaning obligations of the crew and clearly identify Owners liability in this regard. The 2007 London Arbitration Award (716 LMLN 1) mentioned below explores the effect of the construction of such clauses in charterparties.

REDELIVERY OBLIGATIONS

Charterers usually have an obligation to discharge all cargo before re-delivery of the vessel. Remaining cargo in the holds results in extra cleaning costs and time lost, which owners will seek to claim from charterers. Charterers must be aware of their re-delivery obligations under the charterparty.

CEMENT VOY - Clause 15

"After the Charterers' shore discharging equipment or the Vessel's grabs have removed as much cargo as possible, to facilitate the discharging of the remaining cargo residues, the Charterers shall supply free of risk, liability and expense to the Owners, suitable trimming equipment, including bulldozers, and labour. The discharging will be considered completed and laytime shall cease when the Vessel has been shovel cleaned and all the Charterers' equipment has been returned to the shore."

As for cleaning of the holds on re-delivery, specific provisions in the charterparty either place this obligation on the charterers or the owners. The charterers may be required to re-deliver the vessel in a condition as it was on delivery or the charterers may have option to re-deliver the vessel with unclean and unswept holds for a fixed payment stated in the charterparty.

NYPE – Bulk Cement Protective Clause

"Charterers have liberty to carry bulk cement on following conditions...

h) Charterers undertake, after the loading and discharge





of such cargo to clean the vessel with their labour time and expense and to bring the vessel in such a condition as was before the loading of this cargo i) Charterers to be responsible and to pay for thorough cleaning up of all cargo residues from holds, removal/ disposal of residues and washing down/ pumping out of wash water, of all holds by fresh water, immediately after discharge, at their time and expense including equipment and machinery"

NYPE '93 – clause 36

"The Charterers shall have the option to re-deliver the Vessel with unclean/ unswept holds against a lumpsum payment of ... in lieu of cleaning."





CEMENT CLINKER

Cement clinker is the semi-manufactured material which needs to be ground into powder to make ordinary cement. It may present fewer problems than the carriage of cement. Its biggest advantage is that it does not harden when in contact with water, reducing the damage it can cause to the vessel. It must, however, still be kept dry so as to prevent it from caking. Contamination with seawater also results in an increase in its chloride content, adversely affecting the cement produced from it.

CREW SAFETY

Crew involved during the loading, discharging and cleaning process must always be provided with appropriate personal protective equipment ("PPE") and trained on using it properly. Appropriate PPE will include chemical gloves, chemical body suits, eye goggles, breathing masks and boots. All crew must be trained in how to use them properly. Whereas dry cement dust can cause severe eye and respiratory irritation when it comes in contact with mucous membranes, wet cement can also cause severe skin burns if not washed off properly.

HOT TIPS

- → Make sure the holds are clean and dry before loading
- → Be extremely careful if the vessel has previously carried a cargo of sugar
- → Conduct an ultrasonic test before loading to ensure hatch covers are weather tight
- → Discourage loading and unloading during periods of bad weather
- > Discourage loading cargo at very high temperatures as this could produce water vapor in the holds
- After loading, ensure all cement dust is swept away from all exposed surfaces to prevent it from hardening on contact with rainwater or seawater
- → Always ensure crew dealing with cement are provided and trained in using the appropriate PPE
- Consider carefully the cleaning method to be employed from the very start in the event of hardened cement on the hold surface. A wrong approach can exacerbate the situation, increase cleaning costs and cause significant delays
- > Aim to include extremely specific clauses regarding delivery, re-delivery and cleaning obligations in the charterparty
- → Know your obligations and liabilities under the charterparty



CASE STUDY

Our member's vessel was recently loading cement in jumbo bags at Longkou, China, when there was sudden rainfall causing wet damage to the cargo.

Damage:

- → Cargo holds 1 and 2 were closed immediately on observation of a slight drizzle
- → The rain became much heavier within five minutes
- → From this time, it took another five minutes to close holds 3 and 4 due to the presence of stevedores inside the cargo holds who had not stopped working
- → Within just ten minutes of being exposed to the rain, 531 jumbo bags, containing a total of 21,240 bags (50 kg each) of cement were affected
- ightarrow The rain seeped through the bags and holds affecting not only the top tier but also the bottom tier of bags

Claim amount = USD 30,000

- → Discharge of wet cargo
- → Forklift Fee
- → Replacement of wet cargo
- → Re-loading fee
- → Berthing fee
- → Hire payment for 1.5 days
- → Cargo loss

Lessons learnt:

- → The packing bags and jumbo bags should contain a water proof plastic liner to prevent water from seeping in. The shipper should be advised to package water sensitive cargo in an appropriate manner.
- → Stevedores should be instructed to immediately vacate holds in the event of sudden rainfall. Delay by even a few minutes can prove to be detrimental.
- As many hatch covers should be closed at the same time to avoid delay. It is usual that the design of the hatch cover closing hydraulic system allows for the closure of two hatch covers at the same time, but with advanced preparations it may be possible to close more simultaneously. Hatch cover closing systems should be in good operational conditions at all times.
- → Keeping an eye on weather forecasts, the crew should be equipped to close hatch covers on the first sign of rain.



THE BUNGA SAGA LIMA

(2005) 2 LLOYD'S REP 1

Facts:

- → The Bunga Saga Lima was time chartered pursuant to a NYPE charterparty
- → The holds were found to be dirty with coal residues on delivery
- → The time charterers' first cargo to be loaded was iron ore, and the second cargo was rapeseed in bulk
- → The vessel needed to be cleaned only for the second loading

Held:

- → Although the vessel did not need to be cleaned to load iron ore, by not insisting on clean holds on delivery, the charterers had lost their rights to claim for the loss of time and expense incurred to clean the holds at the second load port
- → Under the NYPE and Fixture Note, the only entitlement to place the vessel off-hire in the event of unclean holds was upon delivery or arrival at the first load port, and not thereafter

Lessons Learnt:

- → It is recommended that when a vessel is time chartered pursuant to terms similar to the Fixture Note, clause 13 in the BANGA SAGA LIMA, the time charterers should always require the vessel to be "grain clean" upon delivery/ arrival at the first load port, even if the actual cargo to be loaded at the first load port does not require such cleaning
- → Alternatively the time charterers should expressly reserve their rights to the owners and most importantly obtain the owners' agreement hereto.

For more information, please visit our website http://www.skuld.com/topics/legal/legal-news/the-bunga-saga-lima-case--grain-clean-on-arrival/

THE BELA KRAJINA

[1975] 1 Lloyd's Rep. 139

Facts:

- → The Bela Krajina first carried a cargo of phosphate and then manganese
- → On each occasion, the crew had noticed loose rust and cleaned it off, but when the vessel arrived at the next port to load grain, it was rejected
- → The crew spent a week cleaning the holds
- ightarrow The charterers placed the vessel off-hire during this cleaning period

Held:

→ It was held that 'customary assistance' under the charterparty did not include cleaning operations requiring the use of sophisticated tools like chipping hammers, high pressure water jets and sandblasting equipment



LONDON ARBITRATION

[2007] 716 LMLN 1

Facts:

- → The charterparty contained a specific intermediate hold cleaning clause
- → This provided that the crew should render customary assistance in cleaning all holds while the vessel was en route to the next loading port
- → The clause stipulated that the owners would endeavor to effect such cleaning "as best as possible" but without any guarantee that the holds would be sufficiently cleaned and accepted on arrival
- → When the vessel arrived at its next port to load urea, it failed the hold survey as the holds had not been fully cleaned of the earlier cargo of cement clinker which was discharged in high humidity
- \rightarrow Professional equipment and personnel had to be employed
- ightarrow The charterers argued that the owners had failed to render customary assistance

Held:

- → It was held that there was no guarantee on the vessel to clean to a grain clean standard by way of an intermediate hold cleaning in cases where specialized personnel and equipment was required
- > The intermediate hold cleaning clause was clear in that cleaning was to be performed "without guarantee"

Lessons Learnt:

- → The Owners had protected themselves adequately in excluding liability and limiting the scope of "customary cleaning"
- → Charterers should clearly spell out the specific cleaning obligations required by the Owners under the charterparty to avoid such problems
- The dissenting arbitrator's view is important to take note of. He believed it was the Master's responsibility to have informed the charterers that the holds could not be satisfactorily cleaned by the crew so they could have instructed professional cleaners at the next port earlier

For more information, please visit our website http://www.skuld.com/topics/legal/legal-news/customary-assistanceand-intermediate-hold-cleaning-clauses/



LONDON ARBITRATION

[2010] 798 LMLN 3

Facts:

- → The vessel was time chartered on the NYPE form
- ightarrow The cargo to be carried was cement in bulk from Indonesia to USA
- ightarrow On re-delivery, 130 MT of cement was found to be remaining on-board
- → Owners claimed costs and time lost in discharging this cargo, which were in excess of what they would have normally incurred in the case of simple hold cleaning

Held:

- → Charterers had failed to fully discharge the cargo
- → Although the owners had made no comment or protest on re-delivery regarding the failure to discharge, this did not amount to an estoppel or waiver on their part

Lessons Learnt:

→ Charterers must be aware of their re-delivery obligations under the charterparty to avoid such preventable claims



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