Standard Safety Tankers

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The Standard
for service and security

The Standard

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In this edition

Introduction

Despite higher safety standards on board tankers, the number of tanker cargo-related claims The Standard Club deals with is rising, particularly on chemical and product tankers.

Tanker safety is increasing...

Welcome to this Standard Safety special edition dedicated to tankers.

Many factors have contributed to the increased safety standards on board tankers. In particular, the various new *IMO regulations* and the work of various industry bodies such as *InterTanko*, *International Chamber of Shipping* and the *Oil Companies International Marine Forum (OCIMF)*. Since OCIMF launched the Ship Inspection Report Programme or SIRE in 1993, safety standards on board tankers have drastically improved. According to the *SIRE* website, more than 180,000 inspection reports have been submitted and currently more than 22,500 reports on more than 8,000 vessels are available for inspections conducted in the last 12 months. In light of these improvements, it may seem strange to publish a bulletin dedicated to tanker issues, but we think it is necessary following an interesting analysis of our claims data.

...but it is still a major cause of claims

The Standard Club has analysed more than 30,000 claims for the policy years 2010 to 2014. 40% of these were cargo claims, of which 12% were tanker cargo claims. This means that about 5% of all claims handled by The Standard Club over the period of five years were related to tanker cargoes, amounting to over $30m.

81% of the tanker cargo claims (68% by value) took place on product/chemical tankers, with oil tankers a distant second at 13% (16% by value), and this distribution is consistent across each of the five policy years.

Cargo claims can be divided into either quality or quantity issues. Cargo quality issues or contamination claims can be caused by poor tank cleaning, improper handling of the cargo during transit, wrong line-up of cargo piping or a leaking valve, or by contamination on shore. Contamination claims make up 44% of The Standard Club's tanker cargo claims from 2010 to 2014, with a value of just over $25m.

Introduction continued

Quantity claims, by contrast, only amounted to $4.6m in value, despite being 56% of the cargo claims notified to the club. However, these are increasing in both number and value, and are a particular issue in certain ports such as Pakistan (29%), Bangladesh (8%) and Egypt (8%).

With this analysis in mind, we have put together a wide variety of articles in this special edition, ranging from cargo-specific topics to the controversial issue of blending, plus various legal articles. We have split the articles into categories:

- Fuel oil articles
- Chemical cargo articles
- FAME cargoes
- Cargo shortage
- Cargo operations
- Special operations
- Legal articles

We hope you will enjoy reading this special edition and, as always, we welcome your comments on these articles.

I would like to thank all our authors for their time and effort in contributing to this special edition, and offer a special thanks to CWA International for its contribution.

Ship-to-ship transfer while underway

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Increasing numbers of tankers are involved in ship-to-ship (STS) transfers and the industry has grown over the last two decades. Transfers are now being carried out at various locations around the globe and many coastal states have allocated designated areas along the coastline for transshipments.

STS transfers are cost-effective both for the operator and for the coastal state, but they present an increased risk of contact, fire and pollution.

We have seen increasing numbers of operators using tugs to assist with the mooring operation when the STS manoeuvre is carried out with one ship at anchor. However, the risk is much greater when both ships are underway.

The guidelines

The IMO has produced the guidelines *MEPC 186(59)* which are included in a new Chapter 8 to MARPOL Annex I regarding the prevention of pollution during the transfer of oil cargo between oil tankers at sea while underway or at anchor. These regulations laid the following requirements, amongst others:

- The tanker must have an approved STS plan.
- The coastal state must be notified prior to an STS operation.

Guidelines on the STS plan should be in accordance with the requirements of the *IMO Manual on Oil Pollution Prevention, amended section 1* and *Ship to Ship Transfer Guide* which is jointly published by the Chemical Distribution Institute (CDI), the International Chamber of Shipping (ICS), the Oil Companies International Marine Forum (OCIMF) and the Society of International Gas Tanker and Terminal Operators (SIGTTO).

Personnel and responsibilities

An STS plan should require that the operation is carried out under the advisory control of an individual designated as the Person in Overall Advisory Control (POAC). This could be the master of one of the ships or the mooring master in the event that an STS service provider is utilised for the operation. The POAC should be qualified as detailed in the STS guide and the IMO Manual. The POAC is in an advisory role and their appointment does not in any way relieve ships' masters of any of their duties, requirements or responsibilities.

STS operations when both ships are underway

STS operations while both ships are underway pose a greater risk than operations with one ship at anchor.

Before undertaking an STS transfer while underway, the following requirements should be reviewed to offset this risk:

- A thorough risk assessment of the operation should be carried out.
- STS checklists Nos. 1 to 5 should be completed and complied with.
- Ship characteristics, sea room, traffic density, water depth, the availability of a safe anchorage and emergency abort conditions should be checked prior to selecting the area for the manoeuvre and the STS operation.
- 'Abort manoeuvre' action and signal should be agreed.
- Prevailing weather and current, along with weather forecast for the entire operation, should be checked.
- Fenders, mooring equipment and transfer hose should be tested and certified.

Ship-to-ship transfer while underway continued

- Crew should be experienced and trained for such operations, and a safety drill should be carried out prior to the operation.
- Contingency planning and emergency procedures should be reviewed and agreed.
- Record-keeping should be maintained.
- Extra crew should be available to manage fatigue as the operation involves navigational watch along with cargo watch.
- Dedicated support vessels should be available to respond in an emergency.
- Both ships should maintain the required speed for a minimum of two hours.
- The angle of approach between the vessel manoeuvring and the vessel maintaining constant heading should be decided based on the prevailing conditions.
- The effect of wind and swell on the manoeuvre should be established.
- A mooring plan should be discussed in advance and agreed. Mooring lines should be prepared accordingly.
- The hydrodynamic interaction between the two ships should be understood and appreciated by the bridge team. The disturbed free surface between the ships can lead to significant wave forces on the hull – a low-pressure field occurring between the hulls due to increased fluid velocity can lead to suction forces attracting the two ships.

We recommend that members seek assistance in agreement with the flag and the coastal state to engage specialised service providers that are experienced in carrying out STS operations. These service providers adhere to the flag/state requirements and provide the operator with certified equipment and expertise to ensure the safety of the ship and the environment.

Oil tankers as an alternative to oil storage terminals

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Since the beginning of 2014, increasing numbers of oil tankers are being used as storage tankers. This raises a number of concerns that we would like to highlight in this article.

Background

As oil prices have plummeted since early 2014, increasing numbers of importers are choosing to stockpile their stores in hope of a rebound. Onshore storage facilities are at capacity, so more and more buyers are looking at offshore storage on tankers.

Issues

There are a number of issues to consider when a tanker is used as a storage vessel for extended periods. We recommend that owners consider the following before fixing a ship on extended storage duties.

Anchorage

It is recommended that the storage tanker is anchored at a safe anchorage within a designated area as prescribed by the coastal state.

Stresses on the anchor and chain should be considered due to the effects of prolonged anchorage and potential ship-to-ship operations, as the weight of more than one ship will work on the anchor and chain. Regular inspection of the anchor and chain should be carried out.

Ship-to-ship (STS) operations

The storage tanker as well as the offtake tanker/barge should have an approved STS plan. The tanker is likely to be involved in multiple STS operations. The company should carry out a risk assessment and make a suitable operation-specific STS plan for all transshipments. Crew must be trained in STS operations. Provisions for getting assistance from shore along with tugs and pilots need to be considered prior to STS operations. Other considerations have been covered in the previous article.

Watchkeeping

We emphasise the importance of bridge anchor watches and recommend that bridge watchkeeping is not neglected. Crew work hours should be reviewed and the possibility of getting extra watchkeeping crew should be considered in order to maintain an effective anchor and cargo watch, and to manage crew fatigue.

Effect on the cargo

Shortage claims

There is a possibility that the cargo will be sold in smaller parcels. Cargo transfers out at sea via STS operations are often carried out in open water and can lead to shortage claims given that the exact quantity is difficult to compute.

Cargo blending

Tankers are often used for storing fuel oil. The storage tanker might load multiple grades of cargo from different sources in the same tank. This could involve the blending of cargo and could be in breach of SOLAS regulations. We recommend that permissions are obtained on a case-by-case basis from the coastal state.

Oil tankers as an alternative to oil storage terminals continued

Cargo source
The origin of the cargo should be thoroughly investigated to deal with issues such as smuggling or a sanctions breach.

Cargo quality
Cargo quality may deteriorate over an extended period of time. It may become unstable, produce sediments or have significant microbial activity affecting the quality of the cargo.

Sludge or wax formation can lead to cargo pumping issues and excess cargo remaining on board (ROB).

Effect on the vessel

Tank coating
The tank surfaces in the cargo tank vapour space and in pipelines are exposed to harmful gases, which can lead to coating and steel damage.

Tank washing
Tanks will seldom be completely discharged and so the crude oil washing cycle will be disrupted.

Tank venting
Tank venting, especially in case of sour crudes with high H^2S levels, is a health risk on stationary tankers, especially when there is not much wind. It therefore might be restricted by the coastal state.

Engine maintenance
Suitable maintenance and running of the main engine will be required.

Hull fouling
The hull could get fouled with sea growth due to the extended stay at anchorage.

Other considerations for long-term anchorage

Fuel
Availability of suitable fuel, especially if the ship is in an ECA area, could be a concern.

Crew
Arrangements for crew change will need to be made from the offshore location. Suitable arrangements for personnel transfer need to be made for the crew/surveyors to board the offtake tanker/barge.

Survey
Flag and class will need to be consulted for making arrangements to carry out the periodic surveys and certification.

Provisions
Suitable arrangements should be made to supply fresh water, provisions and stores to the ship.

Samples – your best defence

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Have we ensured that the cargo is shipped in apparent good order and condition? In this article, we will look at best practices that members can follow to ensure they have a good defence when facing alleged contamination claims.

What's the problem?

One of the functions of the bill of lading is that it is the evidence of receipt of the goods on board. It is the duty of the master to ensure that the information shown on the bill of lading is accurate, including that regarding cargo quality. However, in most cases, the ship's staff are not able to assess the condition of the cargo on a tanker, due to loading via a closed system and limited resources on board to check the quality of the cargo. Also, although the master has every right to clause the bills, we have seen that most charterparties require a clean bill of lading. As a result, bills of lading may not be an accurate reflection of the quality of cargo on board.

Most cargo contamination claims are brought against the member at the discharge port. In most cases, the onus lies on the shipowner to prove that the contamination did not occur on board. Given the difficulties identified above, the ship becomes an easy target even if she was not at fault and the cargo was contaminated before it was loaded. Under these circumstances, sampling becomes vital as it can provide the shipowner with an important means of confuting any alleged cargo contamination claims.

When to take samples

It is very important to take samples at each of the stages of loading and discharging so that they can be compared, to identify the source of the contamination. The stages are:

1. Shore tank sample prior to loading.
2. Manifold sample at the start of loading, preferably with the manifold valve closed if possible; thereafter, spot checks should be carried out during the whole loading operation.
3. Manifold samples during loading whenever there is a change in the shore tank.
4. First foot samples from the cargo tank once cargo is received in the tanks.
5. Final cargo tank samples after completion of loading.
6. Cargo tank samples prior to commencement of discharge at the discharge port.
7. Manifold samples at the start of discharge.
8. Shore tank sample at the discharge port if there is any pre-existing cargo in the tank.

Samples – your best defence continued

Who should take the samples?
Cargo surveyors attending at load and discharge ports are more often than not attending on behalf of the shipper and the consignee, and are not obliged to provide samples to the ship. The ship might be handed a sample at the load port for delivery to the receiver at the discharge port. This sample is not the property of the ship. Whether samples are provided to the ship or not, it is recommended that the ship's crew draw samples to protect the interest of the shipowner. Every effort should be made to get the cargo surveyor to sign and seal these samples; however, if the surveyor declines, then a senior officer should sign and seal the sample, and keep it in their safe custody. It is recommended that a ship's officer always supervises the sampling on board to check that the correct and safe sampling procedure is used based on the material safety data sheet (MSDS) of the cargo and that the sampling equipment and bottles are in a good and clean condition appropriate to hold the sample.

Sampling procedure
It is difficult to generalise the sampling procedure for the various liquids which are carried in bulk because of the diversity of the cargoes, the variety of loading procedures and the differing effects on human health and the environment. Safety is vital and utmost care should be taken to avoid any exposure at the time of sampling. Certain chemical cargoes might also require antidotes to be carried on board in case there is exposure to the chemical. The MSDS should be reviewed and the crew should have appropriate training before they undertake any activities where the risk of exposure is high. Hazards must be mitigated by the correct use of personal protective equipment and other safety equipment.

Samples should be drawn in compliance with the industry best practices as set out in publications such as:

- *ASTM D 4057 – Standard Practice for Manual Sampling of Petroleum and Petroleum Products;*
- *ASTM E 300 – Standard Practice for Sampling Industrial Chemicals;*
- *BS 3195 – Methods for Sampling Petroleum Products;*
- *BS 5309 – Methods for Sampling Chemical Products;*
- *API Manual of Petroleum Measurement Standards, Chapter 8 – Standard Methods of Sampling Petroleum and Petroleum Products;*
- *ISO 5555 Animal and Vegetable Fats and Oils – Sampling.*

In general, a 'running' sample taken by use of a bottle and sample cage is the preferred method; however, for non-homogenous cargoes, zone sampling is required to produce a representative composite sample. The properties of some chemical cargoes require that special sampling procedures be adopted such as excluding air, using specialist sample valves or 'closed' sampling methods due to the toxicity or flammability of the cargo. Appropriate safety procedures must be observed and the person taking the samples should always be protected from exposure to the cargo.

Sampling equipment

Sampling equipment and bottles come in a variety of shapes, materials and sizes. Selection of the equipment and the container should be based on the product to ensure that there will be no interaction between the product and the container, which could affect the integrity of either. The following should be considered as a general guide:

- Internal surfaces should be designed to minimise corrosion, encrustation and clingage.
- Inspection cover/cap should be of sufficient size to facilitate filling, inspection and cleaning.
- Sample containers should be clean and free from all substances (such as water, dirt, lint, washing compounds, naphtha and other solvents, soldering fluxes, acids, rust and oil) that might contaminate the cargo sample. Reuse of containers should be avoided; however, if necessary, the containers should be cleaned by a method that has been determined as acceptable for the intended use, for example, by rinsing with a suitable solvent.
- The equipment should be designed to allow safe transfer of the product both from the tank to the container and from the container to the analytical apparatus without affecting the sample product or the safety of the person handling the sample.
- The sampling equipment should be cleaned using a method that has been determined as acceptable for the intended use, for example, by rinsing with a suitable solvent.
- The sample container should be large enough to contain the required sample volume and have sufficient ullage space for expansion and mixing of the sample.
- Glass containers are suitable for many test and storage requirements. Clear glass bottles can be easily examined visually for cleanliness, and allow for visual inspection of the sample. Dark glass bottles offer protection to cargo samples that are affected by light.
- Plastic bottles may be used for certain liquids after ensuring that the sample would not be affected by problems such as solubility, contamination or loss of light components, or would not lead to failure of the sample bottle.
- Certain products can be stored in metal (tin, aluminum or stainless steel) cans. However, it is difficult to check the cleanliness of the cans prior to use. Certain products might become contaminated due to oxidation and corrosion on the can surface.
- Sample bottle closures/caps vary in their chemical resistance depending on the sealing insert. Appropriate sealing caps should be used. Waxed cardboard disc inserts are suitable for most petroleum products. Aluminum disc inserts are unsuitable for acids and alkalis.
- The master should ensure that adequate and appropriate sampling equipment and containers along with labels and seals are available on board, especially when the ship carries different grades of cargo.

Checking of samples

Ship staff might not have the means to analyse the sample, but should be able to check for:

- general physical appearance;
- colour and brightness;
- presence of water (if apparent);
- odour and taint (for non-toxic cargoes – refer to the MSDS for the cargo);
- other physical impurities visible to the eye; and
- the approximate pour point of the cargo if it is heated cargo.

Loading of cargo should be stopped immediately if the manifold samples show such apparent deviations. Further investigation should be carried out and the master should note protest. We recommend the member to also notify the club.

Samples – your best defence continued

Labelling and storage of samples

All samples drawn should be sealed, labelled, retained and recorded. The following information should be recorded on the labels and the sample log for easy cross-reference and traceability:

1. Ship's name and operational status before loading, after loading and before discharge.
2. Product name.
3. Sample source – tank number, manifold number.
4. Sample type – top, middle, bottom, dead bottom, running, composite.
5. Identity of sampler – surveyor, crew member.
6. Date and time.
7. Location – port, berth, anchorage.
8. Seal number.

Sample bottles should be sealed in order to preserve the sample in the event of a dispute. Ship staff should ensure that the correct seal numbers are recorded in the sample log and other cargo documentation. Marked samples should be retained in a dedicated sample locker, ideally for at least 12 months. Samples should not be exposed to extreme temperatures and should be kept in darkness. When no longer required, disposal should be by the appropriate means in accordance with MARPOL requirements. Samples of cargoes that are known to react should not be stowed together.

Conclusion

It is very important that a strict and diligent sampling procedure is adopted and included in the ship's operations manual and that the staff are trained appropriately to follow the best practices required to carry the various grades of cargo that the ship transports.

Carriage of sensitive chemical cargoes

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Wall-wash surveys serve to provide information on tank bulkhead cleanliness, while first-foot surveys provide information on shoreline and vessels' pipeline condition.

Modern-day chemical carriers are capable of safely carrying a wide range of chemical commodities amounting to more than 5,000 different cargoes and grades of material.

While the majority of these commodities are relatively easy to handle and do not demand any special quality requirements, there are certain groups of cargoes that, because of their chemical properties, impose greater handling requirements upon tanker owners, shippers and receivers alike.

Handling requirements – general points to note

Temperature

Certain cargoes demand close control of temperature – heating (e.g. edible oils), cooling (e.g. isoprene monomer) or control of the headspace atmosphere, by either the total exclusion of oxygen (e.g. propylene oxide/hexamethylene diamine-HMD) or partial reduction of oxygen to a proscribed range (as for oxygen-dependent inhibited cargoes such as styrene and isoprene monomers).

Moisture

Exclusion of water might be required, as is necessary for MDI/TDI (methyl and toluene di-isocyanates) and monoethylene glycol (MEG) cargoes, or tank cleanliness may be required to ultra high standards in order to prevent trace contamination by residual organic and inorganic species. Cargoes requiring such high standards include MEG, HMD, methanol, ethanol and products intended for human consumption and end-use in the pharmaceutical industry.

Cleanliness

Generally a high standard of tank cleanliness is required for any chemical commodity and, typically, preloading surveys of the vessel's containment system – tank/pump/heating equipment/lines – include both visual inspection and wall-wash survey prior to the loading of a 'first-foot' trial quantity of cargo. However, for tankers having cargo tanks coated with epoxy-type lining systems, the wall-wash and first-foot survey methods may not necessarily detect previous cargo species that have absorbed into the coating itself. Consideration should therefore be given to cargo sequencing or exclusion of certain tanks, and it is recommended that specialist advice be sought. This consideration does not, of course, apply to tankers with cargo tanks fabricated from marine stainless steels and some of the latest generation of non-epoxy coatings.

Handling requirements – specific cargoes

Monoethylene glycol (MEG)

MEG is a precursor commonly used in the manufacture of polyester and PET resins, with global production for 2015 expected to be in excess of 28m tonnes. The quality parameters critical for the shipment of MEG are water, ultra violet transmission (UVT) and chloride. MEG is hygroscopic, meaning it will readily absorb water from the atmosphere and, as such, an increase in moisture content in the first-foot sample is expected. The unwanted presence of aromatic hydrocarbon species (benzene, toluene, xylene, etc.) has a significant adverse effect upon the UVT parameter, even at parts per million (ppm) concentrations (<5ppm). Such aromatic species can be retained in the vessel's epoxy tank coatings in sufficient concentrations to render

Carriage of sensitive chemical cargoes
continued

the cargo's UVT off specification. The carriage of MEG in epoxy-type coated tanks following immediate previous cargoes of aromatic hydrocarbons is therefore not recommended.

Pure MEG has a UV absorption peak at approximately 180nm, and the presence of impurities can increase this wavelength to around 190nm – 250nm. Therefore, when measuring UV transmission, the presence of aromatic or oxygenate impurities causes a reduction in the transmittance measured at 220nm, 275nm and 350nm, with measurements at 220nm being the most affected wavelength and most indicative of contamination. Sabic, the largest exporter of MEG, lists a minimum transmittance of 70% at 220nm, 90% at 275nm and 98% at 350nm, which can be accepted as an industry standard.

However, some deterioration of the UV parameter can occur during the voyage regardless of contamination, primarily caused by contact with oxygen; therefore, a UV transmittance of roughly 75% or more at 220nm before loading is ideal to ensure the cargo remains on specification at the point of discharge. The use of nitrogen blanketing is important in order to reduce oxygen exposure (see following article for further information on nitrogen blanketing). Reducing the number of transshipments between loading and end point delivery can also keep deterioration to a minimum.

The standard used for measuring UV transmittance of MEG is ASTM E2193 – 08. A spectrophotometer is used to measure absorbance at the specified wavelengths, first using water as a reference cell, then using the test sample. The specification % transmittance can then be calculated using the cell absorbance and recorded sample absorbance.

After the initial measurement, the sample may be sparged with nitrogen, by passing nitrogen bubbles through the sample for 15 minutes. Sparging should remove the effect of oxygen complexes on transmittance, which can help indicate the level of other contaminants such as aromatics. Sparging will, however, give a significantly higher transmittance level from the elimination of oxygen, and the bubbling of gas through the sample may release some volatile impurities, such as benzene, giving a high transmittance that may be unrepresentative of the sample. For this reason, it would be prudent to use the unsparged transmittance during loading in order to prevent a false on-specification reading that could lead to later rejection of cargo.

Styrene monomer (SM)
SM falls under a group of cargoes known as 'inhibited monomeric cargoes', which also includes isoprene monomer. Monomeric cargoes require the presence of an inhibitor to avoid polymer formation. Sufficient amounts of inhibitor must be present and cargo cannot be exposed to any heat. Stowage of inhibited cargoes at elevated temperatures will lead to an increased consumption rate of the inhibitor as well as an increased rate of dimer formation. The formation of dimer (the product when two monomers join) is inevitable, but can be minimised by ensuring that the product is carried at the coolest practicable temperature. Attention to the oxygen content of inert atmosphere is critical as the inhibitor is oxygen-dependent for effective inhibition and the charterer's/shipper's instructions to maintain oxygen content of the 'inert' headspace should be followed.

Phenol
Phenol has a propensity to discolour from colourless to a yellow if exposed to high heat and air. Carriage and replenishment of nitrogen overpressure is recommended during carriage and following part discharge operations to avoid oxygen ingress. Care should be taken to avoid overheating the

cargo, and detailed heating and tank atmosphere (pressure/O_2 content) records should be retained. Samples should be carefully stored in cool, dark places out of direct sunlight.

Methanol
Methanol is the highest volume chemical commodity shipped worldwide and is used principally in the manufacture of formaldehyde resins. It is shipped as an ultra high-purity chemical, so the presence of water and trace contaminants, especially inorganic chloride, are unwelcome. As such, particular attention should be given to tank cleaning operations. (Further information on tank cleaning can be found on *page 23*.) An increasing amount of methanol trade is performed using dedicated tankers, eliminating these cross-contamination concerns.

Ethanol
Ethanol can be shipped as either '96% pure' potable grade or '99.8% pure' for fuel blending purposes. The key sensitive quality parameters associated with each differ in that water is most crucial for the 99.8% pure grade, while the presence of organoleptic taint (smell and odour) is crucial for the potable 96% grade. Due to the organoleptic requirement, attention should be given to sequencing and tank cleaning.

Ethylene dichloride (EDC) and acetone
Both grades are water critical and sensitive to the presence of trace contaminants. Tank preparation should be thorough and avoid the inadvertent introduction of condensation or free water via improperly prepared cargo tanks and/or pipelines.

Nitrogen and its use in bulk liquid transport

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Many thanks to Adam Jackson for his contribution to this article while at CWA International.

Common terms associated with the use of nitrogen in shipping are inerting, purging and padding/blanketing. Purging and inerting are often used interchangeably throughout the maritime industry. However, the International Safety Guide for Oil Tankers and Terminals (ISGOTT) defines inerting as the displacement of oxygen or moisture prior to loading and purging as the use of inert gas to reduce oxygen and flammable gas concentration to below the lower flammability range. Nitrogen padding or blanketing refers to the receipt of nitrogen after loading to reduce the oxygen content and maintain positive pressure, thereby preventing the ingress of air or water (which would cause unwanted reactions and damage to the cargo).

A number of bulk liquid cargoes require the use of nitrogen blankets/inert gas during ocean-going carriage to ensure safety when carrying chemical cargoes that react in the presence of oxygen or moisture. The application of nitrogen blanketing for any purpose is usually requested by the charterer in the voyage instructions or is stated in the International Maritime Dangerous Goods (IMDG) code, but the crew should still carefully consider whether to proceed.

Introduction

The use of nitrogen or inert gas systems has been required on all new tankers over 20,000dwt since 1978. Originally, inert gas systems were devised as a means to prevent explosions during tank cleaning operations. A static charge or sparks could be formed from the use of tank cleaning equipment, which is an enormous safety hazard in a flammable hydrocarbon-rich atmosphere. Inert gas was later required for application above cargoes with low flash points (SOLAS specifies below 60°C) and for grade changeovers in the burgeoning liquefied gas industry. Eventually, as the chemical industry started shipping more complex cargoes with stricter carriage requirements, the use of nitrogen blankets in the vapour space over chemical cargoes (and some edible oil cargoes) that react in the presence of oxygen or moisture became commonplace. Nitrogen is also used during custody transfer operations to clear cargo from shorelines after completion of the cargo transfer.

Chemical cargo reactions

The type of damage that can be sustained by ingress of air depends upon the chemical cargo itself. For example, olefinic cargoes (i.e. those that contain a carbon-carbon double bond) tend to react with oxygen to form aldehydes, ketones and peroxides.

Chemical cargoes such as methanol, aromatics, acetic anhydride, acetone, hexane, decane, isobutyl alcohol, pyrolysis gasoline and ethanol all require inert atmospheres to prevent the formation of explosive atmospheres. This is the most common reason why a nitrogen atmosphere is required during chemical cargo carriage.

Alternatively, some compounds will react with the moisture that may be present in air and form either contaminating side-products or toxic gases (for example, methyl diisocyanate, MDI cargoes). Some chemical cargoes are hygroscopic (such as monoethylene glycol), meaning they readily dissolve moisture from the air, causing an increase in the water content of the cargo, potentially leading to an off-specification cargo.

Polymerising cargoes such as styrene are often inhibited. Their carriage is somewhat unusual, in that the effectiveness of the inhibitor is increased in the presence of oxygen (because of the formation of peroxide radicals after reaction with dissolved oxygen molecules, which is involved in the inhibition/polymerisation termination process). However, styrene is a flammable cargo and will form explosive atmospheres in too high an oxygen content. Therefore, styrene

carriage is performed in a controlled nitrogen/oxygen atmosphere of between 5% – 8% oxygen atmospheric concentrations and, as such, if polymerisation is to occur in a styrene cargo on board a vessel, review of the vessel's tank atmospheric condition records will be critical to defending an owner's position against any possible claim. If an inhibition certificate is provided for this or similar polymerising cargoes, this document will usually specify the atmospheric oxygen range suitable for carriage.

How it works

Most chemical tankers are equipped with nitrogen generators, which can produce nitrogen via a pressure swing membrane-type generator at a purity above 95%. Shore-side cryogenic nitrogen generators can also supply a vessel with high-purity nitrogen prior to, during or after custody transfer, or alternatively, pre-bottled nitrogen can be used. For fire/explosion prevention purposes and tank purging, 95% – 98% purity nitrogen is sufficient. However, higher-purity nitrogen is needed for chemical cargoes, especially those liable to suffer from oxidative degradation.

When inerting a cargo tank, a vessel will have target atmospheric conditions (e.g. cargo tank pressure, atmospheric concentration of previous cargo components) depending upon the cargo being loaded and the cargo that has been discharged, which are often provided on the voyage instructions. For example, after discharge and tank cleaning following the carriage of a low flash point cargo such as gasoline, a vessel will need to reduce the tank atmospheric concentration of hydrocarbon species to below 2% volume in order to load a high flash point cargo such as diesel/gasoil or fuel oil. Therefore, during inerting, the atmospheric conditions are monitored using pressure sensors and electronic gas detectors (such as the Riken RX series of detectors) or indeed through manual monitoring of the tank atmospheric conditions using chemical detection apparatus (such as the common Draeger tube detectors).

After the loading and topping up of the cargo tanks with nitrogen/inert gas is complete, the pressure in the cargo tanks should be monitored throughout the voyage to prevent excessive under or over pressure in the cargo tanks. A vessel can encounter drastic temperature changes between day and night that can affect the pressure in the cargo tank. Careful monitoring of the pressure is therefore necessary. A vessel's cargo tanks will be equipped with high and low pressure alarms that indicate whether a tank needs venting or topping up with nitrogen/inert gas. During discharge of inerted cargoes, it is also necessary to continuously top up the tanks with nitrogen/inert gas to maintain an overpressure, which prevents the ingress of air into the cargo tanks while cargo is discharged.

Summary

Each individual chemical cargo's need for nitrogen atmospheres will be dependent upon the properties of the cargo. The charterer's instructions should be followed when provided, but if they are not provided or seem contrary to what is expected, then the IMDG code or a suitable commodities database should be consulted. This article is only a small summary of some of the technical and safety aspects of the use of nitrogen on board ships. If further information is required, reference should be made to the Chemical Distribution Institute's (CDI) nitrogen best practice advice.

Cargo oil heating practices

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Claims can arise when cargo is not carried at the recommended temperature. Handling of cargo during transit is the responsibility of the vessel crew and owner. In this article, we look at two cargo types and the issues that can arise.

Sudden and rapid changes to cargo temperature should be avoided.

Introduction

It is sometimes essential to apply heat during transit to maintain or raise the temperature of cargo. Over or under heating of cargo can adversely affect the property of the cargo and, on many occasions, this change in the cargo quality is irreversible. Improper temperature control can lead to deterioration in the cargo quality or poor pumping performance leading to excess cargo remaining on board (ROB).

Petroleum cargo

Highly viscous petroleum cargo or cargoes with a high pour point or wax content require heating during transit because heating reduces the viscosity of the cargo and enables it to flow better. Heating also leads to a constant circulation of cargo within the tank. This leads to a reduction in wax formation and sedimentation, and helps in the outturn at the discharge port.

Usually, it is wise to heat early to maintain the temperature during the voyage, rather than to be forced to raise the temperature of the cargo significantly at the end of the voyage. The rule of thumb is that the cargo temperature should be at least 10°C above the pour point during the entire voyage. Heating should not be stopped during the voyage and should be adjusted to gradually change the temperature of the cargo to the desired level and then to maintain it.

Heating instructions are often too vague, with the charterers relying on the experience of the master. This is especially important if the cargo is loaded at a temperature higher than that requested as per the charterparty. In this case, it is recommended to wait for the temperature to fall to the desired level and then start the heating to maintain this temperature. It is important to note that if the pour point of the cargo is high and the required temperature as per the charterparty is less than 10°C above the pour point, then the charterer should be consulted and the agreed temperature should be maintained to minimise any shortage claims. When crudes with high wax content requiring heating are carried, it is important that the charterer provides clear instructions for heating both on the voyage and throughout discharge. The temperature of the cargo at any stage should not be higher than the ship is designed to carry. At the discharge port, the ship staff should ensure that the cargo is stripped immediately after it reaches the level of the heating coils in the cargo tanks.

Edible oil cargo

Edible oils such as the various categories of palm oil and vegetable oils are highly viscous in nature and require special attention during discharge. Each cargo of this type will have specific transportation and handling requirements. Shipowners should ensure that the supplier or

charterer provides all the necessary information about the cargo such as specific gravity, colour, moisture content, impurities, melting point and free fatty acid (FFA) content.

Heating instructions should also be detailed and these should state the in-transit temperature, loading/discharging temperature and the allowed daily rate of increase of temperature. Rapid heating of certain grades can cause scorching of the cargo, and overheating the cargo can promote oxidation, hydrolysis, scorching and discolouration of the cargo. Rapid heating can also cause an increase in FFA content, which causes the cargo to turn sour, and is used as a measure of cargo quality, especially for palm oil.

It is therefore important to monitor the temperature of the cargo carefully and, if increasing, raise the temperature of the cargo at a gradual pace. Proper planning is required for heating these cargoes, especially when a significant rise in the temperature is required over a short voyage prompting a higher rate of heating. To avoid overheating or scorching, small parcels should be stowed in a tank of suitable size and the use of larger tanks, with a large heating coil surface area, should be avoided.

Crew should remember that carriage of heated edible oil cargoes into cold climates may cause the cargo vapours to solidify inside the cargo tank ventilation piping, effectively preventing the pressure in the cargo tank to equalise. This could potentially result in a catastrophic failure of the cargo tank.

The Food and Agriculture Organization of the United Nations (FAO) recommends the practice for storage and transport of edible fats and oils *(CAC/RCP 36-1987)*. It gives guidance on the maximum temperature required for the various grades during transit and while loading and discharging.

These are as follows overleaf:

The acid value (AV) of the cargo is used as a measure of quality. The acid value should not be too high as it denotes an excessively high content of FFA, which causes the cargo to turn sour. Fat is combined with glycerine and fatty acid. When the fat is hot, it decomposes to free fatty acid (FFA) and glycerine (hydrolysis). An increase of FFA means that the cargo will become worse in quality. The quality of palm oil cargo is largely determined by its acid value. Rapid heating results in an increase in FFA content or discolouration.

Cargo oil heating practices continued

Temperatures during storage, transport, loading and discharge

	Storage and bulk shipments		Loading and Discharge	
Oil or fat	**Min °C**	**Max °C**	**Min °C**	**Max °C**
Castor oil	20	25	30	35
Coconut oil	27	32	40[1]	45[1]
Cottonseed oil	Ambient	Ambient	20	25[4]
Fish oil	20	25	25	30
Grapeseed oil	Ambient	Ambient	10	20[4]
Groundnut oil	Ambient	Ambient	20	25[4]
Hydrogenated oils	Various	–	Various	–[2]
Illipe butter	38	41	50	55
Lard	40	45	50	55
Linseed oil	Ambient	Ambient	10	20[4]
Maize (corn) oil	Ambient	Ambient	10	20[4]
Olive oil	Ambient	Ambient	10	20[4]
Palm oil	32	40	50	55
Palm olein	25	30	32	35
Palm stearin	40	45	60	70[3]
Palm kernel oil	27	32	40[1]	45[1]
Palm kernel olein	25	30	30	35
Palm kernel stearin	32	38	40	45
Rapeseed/low erucic acid rapeseed oil	Ambient	Ambient	10	20[4]
Safflower oil	Ambient	Ambient	10	20[4]
Sesame oil	Ambient	Ambient	10	20[4]
Sheanut butter	38	41	50	55
Soyabean oil	Ambient	Ambient	20	25[4]
Sunflower oil	Ambient	Ambient	10	20[4]
Tallow (for voyages of 10 days or less)	Ambient	Ambient	55	65
Tallow (for voyages of more than 10 days)	35	45	55	65

Notes to table

(1) For warmer climates, the loading and discharge temperatures for coconut oil and palm kernel oil are min 30°C, max 39°C or ambient temperature.

(2) Hydrogenated oils can vary considerably in their slip melting points, which should always be declared. It is recommended that during the voyage, the temperature should be maintained at around the declared melting point and that this should be increased prior to discharge to give a temperature of between 10°C and 15°C above that point to effect a clean discharge.

(3) Different grades of palm stearin may have wide variations in their slip melting points and the temperature quoted may need to be adjusted to suit specific circumstances.

(4) It is recognised that in some cases the ambient temperatures may exceed the recommended maximum figures shown in the table.

Conclusion

1. The desired temperature of the cargo should be maintained throughout the loading/discharging operation and during transit.
2. Cargo tanks should be stripped as soon as the liquid is below the level of the heating coils.
3. Clear heating instructions should be given to the master. Any doubts should be addressed sooner rather than later.
4. The cargo plan should include instructions for stripping heated cargo. Sufficient trim and temperature of the cargo should be maintained. Shippers should be aware that heat loss increases as the level of the cargo drops.
5. Heat loss is also accelerated if the cargo tank is in contact with the ballast in the adjoining ballast tank. Ballasting should be deferred until the stripping is completed, if it is safe to do so.
6. Cargo temperature should always be raised gradually.
7. Overheating of the cargo should be avoided.
8. Cargo should not be loaded at a temperature higher than the ship is designed to carry.
9. Cargo temperatures should be checked daily at different levels and the temperature log must be maintained.
10. Over-reliance on remote temperature reading equipment should be avoided and temperature should be compared with other means to check accuracy.

Biofuels and FAME cargoes

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With governments seeking more ways to limit the harmful emissions from petroleum products, the term 'biofuels' is being used with increasing regularity; but what is a biofuel and what are the considerations for mariners when transporting biofuels as cargo?

What is biofuel?
Biofuel is used as an eco-replacement for petroleum products. The most common usage is for transport vehicles, such as cars and buses.

There are two distinct types of biofuel in common usage today: 'biodiesel', which is derived from vegetable oils or animal fats (also known as FAME cargoes) and 'bioethanol', which is produced by the fermentation of various natural sugar and starch sources. This article will focus on FAME cargoes and the considerations for their carriage.

Biofuels and MARPOL
Regardless of source, biofuels must be blended with a petroleum oil product in order to create a substance suitable for use in transport. In the past, there has been some debate as to which MARPOL Annex biofuels would be governed by, since biofuels contain primarily petroleum products (which fall under the auspices of Annex I) but also biodiesel or bioethanol, which have more in common with the substances governed by MARPOL Annex II.

Clarification on this issue may be found in the *2011 Guidelines for the Carriage of Blends of Petroleum Oil and Biofuels as Amended*. These guidelines state that the key factor in the allocation of a biofuel to either MARPOL Annex I or II is the amount of petroleum oil it contains. Biofuel blends containing 75% or more of petroleum oil are to be subject to the requirements of Annex I, while biofuels containing more than 1% but less than 75% of petroleum oil are subject to Annex II.

Biofuel blends containing 75% or more of petroleum oil are to be subject to the requirements of MARPOL Annex I, while biofuels containing more than 1% but less than 75% of petroleum oil are subject to Annex II.

ODME considerations
The 2011 Guidelines for the Carriage of Blends of Petroleum Oil and Biofuels as Amended also includes specific guidance on the relationship between biofuels and oil discharge monitoring equipment (ODME), which can be found in Section 4.1.2:

'When carrying such biofuel blends, Oil Discharge Monitoring Equipment (ODME – see resolution MEPC.108 (49)) shall be in compliance with regulation 31 of Annex I of MARPOL and should be approved for the mixture being transported.'

In order to adhere to this regulation, crew must ensure that the ship's ODME is approved by the administration (flag state) and meets a number of specific requirements:

- The system is fitted with a recording device.
- The recording device is able to continuously monitor oil discharge in litres per nautical mile as well as the total quantity discharged or the oil content and rate of discharge.
- The record produced is identifiable as to time and date, and is kept for three years.

Biofuels and FAME cargoes continued

– The ODME shall ensure that any discharge is automatically stopped when the instantaneous discharge rate of oil exceeds that permitted by regulation 34.
– Failure of the ODME shall stop the discharge.

Contamination considerations

The biggest issue for crews to consider when engaged in the carriage of FAME cargoes is that of water contamination. FAME cargoes are hygroscopic by nature and, as such, are extremely sensitive to contact with moisture either from physical contact or from the atmosphere. Exposure to small amounts of moisture at any point in the supply chain may result in a FAME cargo exceeding the normal commercial sales limit for moisture content, which is normally fixed at 300mg per kg.

In addition to exceeding the commercial moisture specifications, too much moisture may cause several other negative effects, for example:

– undesirable microbiological growth;
– the formation of fatty acids which may result in corrosive processes;
– a reduction in the overall stability of the substance.

The need to avoid contact with water has a particular relevance to tank cleaning procedures. It is crucial post tank cleaning to ensure that the surfaces of the cargo tanks are thoroughly dried prior to loading any FAME cargo. Crews should also be aware of the propensity for FAME cargoes to cling to the surfaces of tanks only to re-emerge at a later date and cause contamination issues with subsequent cargoes. Scrupulous attention to detail is therefore required to ensure that the tank cleaning routine meets the needs and characteristics of the cargoes before and after shipment of a FAME cargo.

FAME cargoes are, like many cargoes, susceptible to the effects of degradation when exposed to heat, certain atmospheric conditions and light. For instance, careful consideration should be given to the location of the tank that the FAME cargo is to be loaded into since the cargo may be affected by being adjacent to a heated tank.

This sensitivity to temperature may also be manifested when a FAME cargo is exposed to extremes in heat and cold during the course of a voyage. Particular attention should be paid to the issue of temperature when the voyage will take a FAME cargo from warm, moist conditions to a colder discharge region/port. To avoid issues with the cargo caused by a build-up of waxy-like precipitates, proper heating regimes should be applied. Guidance on FAME cargo temperature considerations may be obtained from the Federation of Oils, Seeds and Fats Association (FOFSA) which has published guidance on this issue.

Conclusion

FAME cargoes may be a sensible alternative to petroleum products, but if their use is due to become widespread, shippers should make themselves aware of the implications for safe carriage.

Scrupulous attention to detail is required to ensure that the tank cleaning routine meets the needs and characteristics of the cargoes before and after shipment of a FAME cargo.

Pakistan shortage claims

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Liquid cargo shortage claims continue to be a routine occurrence in Pakistan. Individual claims are generally of low value, but as there tend to be numerous claims raised, the total claim value can be substantial. Difficulties arise in the handling of such claims due to the peculiarities of this jurisdiction.

Scenario

When a ship arrives in Pakistan, she is typically required to discharge her liquid cargo into customs-bonded shore tanks. The various consignees then take delivery of the cargo from these shore tanks. When claims for shortage arise, they are raised against the ship. The allegation is that the quantity of cargo received from the shore tank is less than the quantity of cargo stated in the bill of lading. When legal proceedings are commenced, the shipowner and the local agents are usually named as co-defendants. This is notwithstanding that an empty tank certificate has been issued and signed off by the various consignees' surveyors confirming that the ship discharged all her cargo into the shore tanks.

Legal position

A shipowner may raise all available defences against such claims since it should not be liable for cargo shortage that occurs after discharge from the ship. The Pakistan courts have not however adopted a uniform legal position on this issue. There have been a few lower court judgments that have decided in favour of the shipowner or have taken into account varying levels of trade allowances.

What to do with such claims

In the meantime, if such claims are raised, the shipowner has the following options:

Ignore or reject the claims
Where claims are initially rejected or ignored, the likelihood is that the claimant will pursue formal proceedings against the shipowner and the local agent. If all named defendants continue to ignore the suit, a judgment in default of appearance will eventually be obtained, which will allow the claimant to enforce the judgment against the ship on her return to Pakistan or against the local agent's assets.

Defend the claims
Suits will require, on average, five to 10 years before a first instance judgment is issued by the lower courts. The legal costs incurred to defend such claims are not recoverable from the claimant, even if the shipowner successfully obtains a judgment in its favour. As such, legal fees are usually negotiated on a lump sum basis ranging from 10% to 15% of the claim value.

A local correspondent's assistance may additionally be required in certain circumstances and so members should anticipate incurring additional correspondent fees over the life of the suit.

Pakistan shortage claims continued

It is therefore likely that the total fees incurred to maintain defences for protracted proceedings may form a substantial portion of the total claim value. Some shipowners may therefore prefer to take a commercial view on such claims.

Amicable settlement of the claims
If so, the local agent, correspondent or a local lawyer may assist to negotiate amicable settlements of cargo shortage claims. It is possible to negotiate with the claimant so that trade allowances are deducted from the alleged shortages.

Most claimants are prepared to settle in the region of 30% of the claim value and so the benefit to a shipowner is that savings are made on the fees that would have been incurred in defending the claim.

Charterparty terms

The shipowner may include a term into the charterparty that requires the charterer to handle, defend, settle and be responsible for all cargo shortage claims that are raised in Pakistan. Alternatively, a letter of indemnity (LOI) may be obtained from the charterer stating similar terms.

However, the shipowner is unlikely to obtain immediate benefit of such terms if claims are raised in Pakistan. This is especially the case if the master issued the bills of lading or if the claimant names the shipowner and its local agent in formal proceedings. Regardless of the charterparty or LOI terms, the defence costs to the shipowner will be as mentioned above, since the shipowner will be obliged to defend the claims in the first instance.

Further difficulties arise if the charterer does not comply with these terms. The shipowner will need to enforce the terms by pursuing an indemnity against them. This requires the shipowner to first defend all the cargo shortage claims until a judgment is issued before it is entitled to pursue an indemnity against the charterer.

The process of pursuing an indemnity against the charterer will also require the merits of each shortage claim to be reviewed individually together with the indemnity provisions in the charterparty. The shipowner must therefore be prepared to incur various sets of legal costs, which may exceed the total claim value.

Conclusion

When trading to Pakistan, shipowners should anticipate that shortage claims will be raised against them regardless of whether there has been a genuine shortage at discharge. The above difficulties should be borne in mind given the nature of the jurisdiction and the options available to shipowners in the handling of such claims.

Tank cleaning operations

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The primary purpose of tank cleaning aboard oil, product and chemical tankers is to remove the most recent cargo from the vessel's containment systems (tanks/lines/pumps) in readiness for the next cargo. Cleaning also prevents the accumulation of cargo residues and is a necessary step in preparing cargo tanks for gas-free entry.

Introduction

Due to the great number and variety of chemicals and petroleum products carried aboard tanker vessels, it is unlikely that two consecutive cargoes will be the same or compatible with each other. In most cases, the presence of previous cargo residues, even in small amounts, will be undesirable. Systematic cleaning allows tankers to completely change the grade of cargo carried from one voyage to the next.

The level of tank cleaning that needs to be undertaken will be determined by:

- the chemical and physical properties of the cargo that has been discharged;
- the type of tank coatings (or stainless steel); and
- the preloading specifications of the next cargo.

Machines and methods

The principle means of tank cleaning aboard all tanker vessels is the 'Butterworth' tank cleaning machines, which nowadays are permanently mounted in the most efficient locations within each cargo compartment to effect optimum coverage of the tank surfaces and are rated according to tank capacity. Alternatively, some vessels employ portable tank cleaning machines (with and without 'fixed' systems), raising and lowering them to 'drop' levels within the tank to achieve optimum coverage.

Tank cleaning utilises sea and fresh water as the wash fluid, with and without chemical additives such as surfactants, alkali or acidic wash agents (the latter is not suitable for zinc-coated tanks), and solvent components that are available as proprietary IMO-approved tank cleaning products. The wash fluids can be delivered by the tank cleaning machines at ambient temperature or heated, using the vessel's tank washing heat exchanger, to temperatures up to 70°C – 80°C.

Other tank cleaning techniques include direct spray of cleaning chemicals or distilled/deionised (DI) water to tank surfaces by high-pressure equipment and 'live' steaming of the tanks.

Establishing the correct tank cleaning plan is essential and here reference can be made to industry Tank Cleaning Guides (TCGs) such as Dr Verwey's, Miracle, Milbros, Energy Institute: HM50 and those provided by the many tank cleaning chemical providers and oil majors. Experienced owners often develop their own in-house methods and procedures. It is important to efficiently clean the cargo tanks and not perform unnecessary over-cleaning as this wastes energy and money.

Tank cleaning operations continued

The objective of the wall-wash survey is to assess the surface cleanliness of the entire cargo tank; however, in practice, it is only possible to draw samples from the lower 2m of the vertical bulkheads, a zone that sometimes receives extra attention from a ship's crew during cleaning, creating the possibility of non-representative wall-wash samples being obtained.

Effectiveness

The effectiveness of tank cleaning operations is assessed by wall-wash inspection, which involves applying solvent to selected areas of the cargo tank bulkheads and thereafter analysing the recaptured solvent for 'key' quality parameters. Typically, approximately 0.5l – 1.0l of solvent, which is often methanol but can also be toluene/acetone/DI water or even the next cargo to be loaded, is sprayed at head height onto the vertical tank bulkhead. The solvent is allowed to run down the surface and is collected into a clean bottle using a truncated funnel.

Though it will never be a repeatable procedure, this inspection practice can be standardised by washing approximately 1m² of tank surface at a given number of locations on each bulkhead. *ASTM E 2664 'Standard Test Method for Methanol Wall Wash of Marine Vessels Handling Polyester Grade Monoethylene Glycol'* is becoming a commonly used standard amongst inspection companies as well as ships' crew.

It is important to keep all wall-wash equipment chemically clean and to avoid contamination of the wash solution by contact with skin, clothing and sweat. It is not good practice to wall-wash wet or still-warm bulkhead surfaces.

Intertanko standards

With the advent of ever more sophisticated methods of analysis, the specifications applied to the carriage of chemical and petroleum cargoes have become increasingly stringent, sometimes driven by the commercial competitiveness of the shippers/charterers to market their goods to a higher specification than their rivals. Nowadays, there are five commonly recognised standards for tank cleanliness as outlined by Intertanko on the next page.

The ship's crew must be competent in performing the wall-wash survey and measuring the 'key' quality test parameters specified by the shipper/charterer:

- inorganic chloride;
- colour;
- water miscibility (hydrocarbons) test;
- Permanganate Fade Time (PFT).

Increasingly, owners are equipping their vessels with UV-vis absorption spectrometers, enabling UV absorption to be determined. At present, gas chromatography testing and 'Karl Fischer' testing for dissolved water is not performed aboard ships, but this is expected to change as technological advances improve the reliability and miniaturisation of the instruments.

By employing the above wall-wash survey techniques and 'key' testing of the wall-wash solution, the ship's crew can monitor each step of the tank cleaning plan to ensure the effectiveness of each cleaning stage.

Tank coatings

A common problem faced during tank cleaning is the property of certain epoxy-type tank coatings to absorb certain volatile chemical cargoes during laden voyage, only to be reintroduced as a contaminant into the subsequent parcel carried in the same tank by an absorption/desorption mechanism. Past experience has shown that conventional tank cleaning techniques are incapable of removing all previous cargo residues absorbed into the epoxy coatings.

Intertanko's five standards of tank cleanliness

Definition	Tanks suitable for	Additional comments
1. Visually clean		
Dry, free of visual residues of previous cargo and/or foreign matter	Phosphoric acid, caustic soda, FAME, veg oils after CPP/veg oils, CPP after CPP/veg oils	
2. Water white standard		
Dry, odour free, free of visual residues + wall-wash with suitable solvent shows – colour PtCo (ASTM D 1209) less than 10	Styrene monomer, acrylonitrile, MTBE, ETBE, hydrocarbon solvents, chlorinated solvents, isopropyl alcohol, acetone, MEK, MIBK	Methanol is a suitable solvent for wall-wash tests in most cases
3. BTX standard		
Dry, odour free, free of visual residues + wall-wash with toluene – colour PtCo (ASTM D 1209) less than 10 Acid wash* – colour (ASTM D 848) less than 2	Benzene, toluene, xylene, sulphuric acid	Acid wash colour is affected by unsaturated products, such as all inhibited cargoes, veg oils, olefins, pygas and gasoline
4. Methanol standard		
Dry, odour free, free of visual residues + wall-wash with methanol confirms to: Water miscibility test (ASTM D 1722) passes – colour PtCo (ASTM D 1209) less than 10 – Chlorides less than 2 ppm – Permanganate time test above 50 min – UV spectrum passes	Methanol, ethanol, MEG fibre grade, food grade and pharmaceutical grade cargoes (acetic acid, MPG-USP grade)	IMPCA specification is the international methanol standard and includes strict UV specification. Readings: – Max 0.25 at 220 nm – Max 0.10 at 250 nm – Max 0.02 at 268.5 nm – Max 0.01 at 300 nm
5. Ultra clean standard		
Passes methanol standard + wall-wash with suitable solvent: – Non-volatile matter less than 10 ppm* – Last cargo by GC* or other suitable method less than 2 ppm	Highest purity chemicals, such as 1-hexane, 1-octene, HMD, acetic anhydride	Tank is completely free of residues as detectable by modern instrumental methods

* Acid wash test, Gas Chromatography (CG) and non-volatile matter cannot be tested onboard.

Tank cleaning operations continued

As such, due care and consideration with regard to the sequencing of cargoes is required to ensure that incompatible cargoes which may adversely affect the sensitive quality parameters of the next loaded cargo are not carried in the nominated tank immediately prior. An example of this includes the carriage of any aromatic type cargo prior to loading a parcel of monoethylene glycol (MEG), which would adversely affect the UV properties of the MEG cargo. A pictorial depiction of the cargo absorption/desorption mechanism is provided below.

Cleaning times and temperatures

Whilst TCG recommendations for cleaning times and temperatures are a useful guide, it is essential to monitor the effectiveness of the operations in order to avoid under and over cleaning. For example, if too many tank cleaning machines are employed at any one time, this will lead to a reduction in water pressure and dramatically impair the effectiveness of the cleaning. While the above is undesirable, effective monitoring of the tank cleanliness will ensure that the cleaning stage is repeated until the required degree of cleanliness is attained.

Cargo-specific properties need to be given careful consideration; for example, too high or low a temperature at the initial washing stage can result in significant problems during the latter cleaning stages. For example, styrene monomer has a tendency to polymerise and a number of edible/vegetable oils, including soyabean, cottonseed, linseed, castor and fish oils air-dry, leaving behind hardened deposits which are difficult to remove. These polymerising and drying/semi-drying cargoes require prompt initial washing with ambient temperature water to avoid the formation of hardened deposits. Ambient temperature water should also be used for the removal of volatile/flammable cargoes in order to reduce the fire/explosion risk. Water-soluble cargoes, such as alcohols/glycols, need only be warm water washed, preferably with fresh/deionised water.

In contrast, using higher-temperature cleaning water is desirable in some instances. The use of hot/warm water improves the solubility of high melting point cargoes such as phenol and vegetable oils, including palm and coconut oil products, which require elevated temperatures to ensure the products remain liquefied, thereby expediting removal.

Completion

Finally, the ship's crew, upon completion of tank cleaning operations, can perform a final wall-wash survey to ensure that the ship's tanks will 'pass' the preloading wall-wash inspection for the standard of cleanliness appropriate for the next nominated cargo advised by the charterers.

Blending versus commingling

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On 1 January 2014, an amendment to SOLAS Chapter VI on the Carriage of Cargoes and Oil Fuels came into force, prohibiting the blending of bulk liquid cargoes and production processes on board ships during the sea voyage. As SOLAS does not define the meaning of 'sea voyage', this ambiguity has led to a number of questions from members about these amendments to Chapter VI and regarding blending/commingling generally.

Definitions

Blending is defined by SOLAS as follows:

'Physical blending refers to the process whereby the ship's cargo pumps and pipelines are used to internally circulate two or more different cargoes with the intent to achieve a cargo with a new product designation.'

Commingling on the other hand means the operation of loading in the same cargo space on board a ship parcels of the same product/bulk cargo (usually liquid) with the same specification from different sources such as different shippers or ports, but without taking any other steps in relation to the product/bulk cargo other than to carry and discharge and deliver it.

Loading of the same product with the same specification from different shore tanks, barges or trucks, etc. from the same port or the same single terminal does not constitute commingling (or blending). The 'same product' does not mean identical products as it is appreciated that chemical composition, including water, cat fines, etc. might vary slightly. However, the product variation must fall within acceptable limits for the cargo to retain the same cargo categorisation.

Cargo operations in practice

Blending and commingling constitute intentional contamination of one cargo with another; so charterers/shippers/receivers should bear the risk of the cargo not being mixed to form a homogenous product.

The master should be given specific instructions prior to loading to assess whether the multiple grades can be safely loaded in the specific cargo tanks without any risk of tank overflow or pollution. It is also recommended, if possible, to get the chemical analysis of the final product done prior to loading to check on the physical and chemical characteristics of the cargo, especially the pour point, cloud point and if there is going to be any wax formation which might lead to excessive cargo remaining on board on discharge.

When agreeing to blending or commingling cargoes, the master should also consider the overall effect on the ship's stability. The blended density will be different to that of the originally loaded cargo and this may have a direct effect on the ship physically, including trim and draught. Also, when blending or commingling crude oil cargoes, significant wax drop-out can occur, which will result in difficulties in discharging and significant cleaning costs.

Blending versus commingling continued

Bills of lading and LOIs

It is important that the exact cargo description and the exact operation are clearly defined in the bill of lading to avoid falling foul of the provisions to the cargo rules regarding description. The bill should show:

- quantity;
- cargo type;
- loading port; and
- date

for all the blended or commingled cargoes.

Where bills of lading have already been issued for part of the cargo on board, the master should ensure that these are surrendered and cancelled before any new bills, which cover the final product, are issued.

Where commingling (or blending) is requested by cargo interests, it is recommended that a letter of indemnity is sought. Of course, an indemnity is only as good as the creditworthiness of the party granting it, so before going ahead, members should ensure that they are fully satisfied with the financial standing of the indemnifiers. An LOI is not enforceable if the underlying transaction is intended to defraud a third party, for example, where it is received in return for misdescribed cargo.

Club cover

Commingling

Claims arising out of commingling are generally accepted as poolable.

In so far as a cargo claim does arise, it is essential for poolable cover that the bill of lading properly reflects the cargo on board as set out above. Failing which, members will fall foul of provisos (7) and (8) to the cargo rules regarding description.

Provided the bills of lading properly reflect the cargo on board, P&I cover will be operative in the usual way.

Blending

In relation to blending operations, there is currently no express exclusion in the Pooling Agreement. However, given the specialist nature of the blending operation, which is comparable to using the ship as a floating chemical laboratory, to the extent that liability arising from a blending operation could be considered imprudent, unsafe, unduly hazardous or improper, this may trigger the hazardous trade exclusion, which would render any *claim discretionary under rule 4.8*.

In reviewing such a claim, the board will take into consideration whether the recent changes to SOLAS Chapter VI have been complied with. The same provisos with respect to issuing bills of lading would also apply.

SOLAS

1 January 2014 saw the entry into force of a number of amendments to SOLAS. Amongst these, the changes to *SOLAS Chapter VI – Carriage of Cargoes, Regulation 5.2*, have a particular significance for the conduct of cargo operations on board tankers. Regulation 5.2 now prohibits the practice of physical blending of bulk liquid cargoes during sea voyages.

For the purpose of the SOLAS amendments, physical blending operations have been defined as:

'the process whereby the ship's cargo pumps and pipelines are used to internally circulate two or more different cargoes with the intent to achieve a cargo with a new product designation'.

The regulation goes on to state that:

'any production process on board a ship during sea voyages is prohibited'.

It should be noted, however, that this regulation:

'does not preclude the master from undertaking cargo transfers for the safety of the ship or protection of the marine environment'.

The regulations do not apply where cargo is recirculated within its cargo tank or through an external heat exchanger during the voyage for the purpose of maintaining cargo homogeneity or temperature control, including when two or more different products have previously been loaded into the same cargo tank within port limits.

Likewise, where a cargo becomes homogeneously mixed simply by discharging it ashore alongside a terminal using the ship's pumps, this will not fall foul of the new SOLAS regulations. The same would be true where the operation takes place by STS operations either within port limits or STS operations at sea.

If the ship alone was blending cargo on board by recirculation between tanks during a sea voyage, this would clearly be in breach of the new regulations. The same would arguably be true if the ship was blending at a designated site offshore. We say 'arguably' because SOLAS does not define the meaning of 'sea voyage' and this ambiguity has led to a number of questions from members. That said, although SOLAS does not define the meaning of 'sea voyage', the intention of the regulation would appear to prohibit the physical blending of bulk liquid cargoes using the ship's cargo pumps and pipelines outside port limits, whether at anchor or not.

If a member intends to undertake physical blending operations within port limits, whether at anchor or moored, authorisation should first be sought from the local port state administration in order to ensure that the local interpretations of Regulation 5.2 are understood and complied with.

Whether blending is permitted if a ship is at anchor outside port limits is still open for discussion and will depend upon the flag state and local authority's interpretation of 'sea voyage'.

Conclusion

Each instance of commingling and blending will need to be considered on its own facts so that the club can determine whether there are any cover issues which might arise from the cargo operation in question. The above is therefore only for general guidance, and members and brokers should speak to their usual club contact should they have any questions.

Cargo contamination on tankers

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There has been an increase in the number of claims brought against ships for cargo contamination by water and other products. This article looks at ways to mitigate the loss for the owner/member when faced with a cargo contamination claim.

Introduction

When cargo is found to be contaminated, the origin of the contamination could be the shore tank at the load port, the shore pipeline during loading or the ship itself. But if the cargo on board is found to be 'off spec' on arrival at the discharge port, the ship is held liable as the carrier, regardless of fault, and will be faced with a claim.

Mitigation of loss

A fundamental principle in both continental and Anglo-American legal systems is that the claimant – usually the cargo receiver – is bound to mitigate his loss. However, judges/arbitrators often rule favourably for the claimant even if they have not managed to mitigate the loss, so long as the decisions taken at the time appeared to be reasonable and sensible, which leads to the defendant being faced with a claim for the entire cargo at sale value. It is therefore in the interest of the member and the club to play an active role in mitigation discussions, either to ensure that mitigation of the loss does take place to reduce the claim amount or to build evidence that mitigation was not attempted.

Where to store the cargo?

Since keeping the vessel 'on the move' is always the first priority for the shipowner, the first decision to be made when facing a cargo contamination claim is usually where to store the cargo while waiting for the laboratory results and considering next steps. There are a few options to consider for transferring the contaminated cargo.

Vessel's slop tanks

This is an economical option subject to slop tanks' availability, given that no external storage costs are incurred, and this offers the flexibility of taking the cargo to ports with appropriate reconditioning facilities. However, the cargo receiver should not be given the impression that he has thereby successfully refused to take delivery of the cargo. Also, the vessel should take utmost care to ensure that the nominated cargo tanks and associated lines are thoroughly cleaned before and after the transfer in order to prevent any increased contamination. Due consideration should also be given to ensure that the contaminated parcel is properly isolated from the remainder of the on-specification product. In the event of a flashpoint contamination, this will include isolating the inert gas system serving the slop/nominated tanks containing the low flashpoint cargo.

Sampling the cargo can help prove contamination did not happen on board. Read our article on *page 7* for more information.

Another vessel/barge
This option releases the vessel from keeping the contaminated cargo on board, but involves an additional potential source of contamination.

Shore tanks
Empty shore tanks are usually available in larger ports. However, if the cargo cannot be reconditioned in the vicinity of that port, the problem is just postponed, and not resolved. Further, considerable storage costs may be incurred if the cargo is left in the shore tank for a long period. In cases where the vessel has several ports of call on the voyage, it might be sensible to assess whether any of the other ports provide more suitable storage/restoring facilities and make arrangements to discharge the cargo there.

What are the mitigation options available?

The options for minimising the loss will depend on the nature of the cargo, the type and extent of contamination, the market for the product and the facilities available in the area. There are some options to consider for restoring the cargo, with the assistance of suitable cargo experts.

Distress/salvage sale
One solution is to sell the contaminated cargo 'as is'. The contaminated product may, for instance, still pass as an 'industrial grade' product and the difference in sound/salvage values may not necessarily be significant. Therefore, simply selling the cargo in the contaminated state can be a quick and reasonable solution, provided there is a salvage market available.

Blending with sound product
Another solution could be to blend the contaminated cargo with sufficient sound product to essentially dilute the contaminants to insignificance. This option depends on the availability of sound blend stock either in another of the vessel's tanks or in shore tanks. Due care should be taken to avoid an increase in contamination as a result of the blending operations. Suitable experts should be consulted beforehand and throughout the process.

If blending is carried out on board the ship itself then it should be done in compliance with SOLAS regulation VI/5-2 (see previous article). However, past experience has shown that on-board blending operations are not very effective as the usual tank architecture and pipeline configuration may not allow for efficient and intimate blending of the cargo.

Distillation
If there are substantial quantities of contaminated cargo and blending is therefore not a realistic option, reconditioning by distillation (performed by various operators within the petroleum refining/ petrochemical industry) could be an efficient way to resolve the problem. Any mixture of two components with different boiling points can in principle be separated by distillation, thereby removing the contaminant(s) from the sound cargo. Distillation does, however, come at a price. Apart from the energy cost, 1% – 2% of the product is usually lost in the process due to evaporation. Bearing in mind that the minimum quantity of product accepted by the reprocessing plants is typically around 500mt, distillation is only economically attractive when larger quantities are involved.

Cargo contamination on tankers continued

Filtering
If the contaminant consists of solid particles (non-homogenous components), or if the contamination is minor or a matter of colour and/or odour, reprocessing/filtering may be another option available. Rather than separating the two components, as would be the case when distilling, this technique removes the contaminant(s) by running the contaminated product through a mechanical or chemical filtering unit. Due to the relatively small and mobile filtering units available, the reprocessing can even take place on board. The relevant reconditioning costs are also significantly lower than the distillation costs. However, there is a limited number of contaminants that can be successfully removed using this technique and also a limited quantity of contaminated cargo that can be effectively filtered within a reasonable amount of time. Also, about 0.5% of the product is expected to be lost in the process (not including the contaminant(s)).

Conclusion
Salving contaminated cargo is not achieved without effort and cost, but the above are options worth considering and the most appropriate for the particular case should be adopted. Both the member and the club will benefit from actively ensuring that the cargo interests take steps to mitigate their loss, as well as putting forward to the cargo interests some proper mitigation options to reduce the level of the claim.

Tendering a valid Notice of Readiness

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It is a well-established principle of English law that laytime under a voyage charterparty will only commence once a valid Notice of Readiness (NOR) has been tendered. While the ship's physical location at the time of tendering the NOR is an important consideration, so is the method by which the NOR is tendered.

Introduction

The commercial reality of today is that communication between the ship and its charterer is commonly done using email, rather than by earlier methods of communication such as fax and telex. However, a number of standard form charters which predate email are still widely used. As a result, some charterparties do not mention email at all. This was the situation faced by the owner in *The Port Russel*[1] English High Court decision.

The Port Russel

The *Port Russel* was chartered on an amended BPVOY3 form to carry a cargo of clean petroleum products. Clause 19 of the charterparty, relating to the tendering of a valid NOR, was unamended and provided that the NOR was to be tendered either by *'letter, facsimile, transmission, telegram, telex, radio or telephone'*. In this case, the NOR was tendered by email. The question before the English court was whether email was a contractually permissible method of serving the NOR under the charter.

The judge hearing the case concluded that email was not a permissible method to serve the NOR under this charter. In the judge's view, the only contractual methods under which an NOR could be tendered were the methods specified in clause 19 itself. This list was exhaustive and there was little point, in the judge's view, to specify a list of valid methods for tendering an NOR if any method was permissible.

The club's recommendation

The decision in *The Port Russel* ought to be taken into account whenever fixing a ship under a voyage charterparty. An owner does not want to inadvertently tender their NOR using a method not specified/permitted in the charter, because it may have drastic consequences for their subsequent entitlement to claim demurrage.

A review of some of the more common voyage charterparties used in the liquid cargo trade reveal that some charters allow for the NOR to be tendered by email, while others do not.

1 Trafigura Beheer BV v Ravennavi SPA (*The Port Russel*) [2013] EWHC 490 (Comm).

Tendering a valid Notice of Readiness
continued

Charterparty	NOR clause	NOR methods
Asbatankvoy 1977	Cl. 6	Letter, telegraph, wireless or telephone
Bimchemvoy 2008	Cl. 10	Requirement that NOR is given but no method specified
BPVOY3	Cl. 19	Letter, facsimile transmission, telegram, telex, radio or telephone (and if given by radio or telephone, to be confirmed in writing, and if given by facsimile, to be confirmed by telex)
BPVOY4	Cl. 6	Letter, telex, facsimile or telephone (but if NOR is tendered by facsimile or telephone, to be confirmed promptly by telex)
BPVOY5	Cl. 10	Email, radio or telephone (but if NOR is tendered by radio or telephone, it shall be confirmed promptly by email)
ExxonMobil VOY2000	Cl. 11	Letter, electronic mail, telex, facsimile, radio or telephone (if radio or telephone, to be confirmed promptly in writing)
ExxonMobil VOY2005	Cl. 11	Requirement that NOR is given but no method specified
ExxonMobil VOY2012	Cl. 11	Requirement that NOR is given but no method specified
Shellvoy 6	Cl. 13	Written notice. No specific method required
Vegoilvoy	Cl. 4	Letter, telegraph, wireless or telephone

If the charterparty under negotiation does not provide for the tendering of NOR using email then, assuming email is the normal method used by the ship, it is suggested that the relevant clause relating to the tendering of NOR be amended. This can be done either in the fixture recap, or by means of an additional clause to the charterparty.

Such a clause could be a replica of clause 10 of BPVOY5 form, which provides:

'NOR may be tendered either by email, radio or telephone, (but if NOR is tendered by radio or telephone it shall be confirmed promptly by email).'

Laytime and free pratique

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Laytime commences once a valid NOR is tendered. This article discusses how the requirement for free pratique can affect the validity of an NOR, looking at relevant cases to provide guidance.

Commencement of laytime

Owners will always seek to start laytime running from the moment they present their ship to charterers at the agreed port or berth so as to avoid responsibility for delays that are beyond their control.

In order for laytime to start, owners must tender a valid Notice of Readiness (NOR). The purpose of an NOR is to inform the charterer that loading or discharge operations are ready to commence and to provide a tangible starting point for laytime.

In order to be valid, the NOR must be tendered when the vessel is **in all respects** actually ready to load. This will depend on a number of factors, including whether the ship has complied with all the port health and documentary requirements.

The effect of free pratique

One such factor is whether the vessel has been granted her *free pratique*. Free pratique is essentially the licence given to a ship to enter a port on the assurance that she is free from contagious diseases.

The granting of free pratique is seen as something of a mere formality and, at common law, will not prevent a valid NOR from being tendered, as noted by Longmore L.J. in *The Eagle Valencia*[1]. However, in reality, although this may seem like an outdated concept, the free pratique still forms an important part of the ship's papers and can cause problems for owners if it is not obtained. In fact, the common law position is often superseded by express agreements between owners and charterers. For instance, clause 6.3 of the BPVOY4 form charterparty states that:

'Notwithstanding tender of a valid NOR... such NOR will not be valid unless the following conditions have been met...

6.3.3 If free pratique is not granted within six (6) hours of the Master tendering NOR...the Master shall issue a protest in writing...to the port authority and the facility at the port ("Terminal")...'

And clause 7.3.2 states:

'Laytime or, if the Vessel is on demurrage, demurrage shall commence...upon the expiry of six (6) hours after a valid NOR has become effective as determined under Clause 6...'

Therefore, on the assumption that free pratique is a requirement of a particular port, owners must ensure that it is granted within six hours of tendering an NOR in order for it to be valid and for laytime to commence.

1 [2010] EWCA Civ 713.

Laytime and free pratique continued

Situations where free pratique is not granted

If free pratique is not granted in this period, owners can protect themselves from being penalised under clause 6 by issuing the appropriate Notice of Protest.

This is without question and was confirmed in the *Bow Cedar*[2], where it was held, obiter, that an NOR becomes effective on the master issuing a protest. However, on the assumption that the appropriate protest has been registered, the key question is: when will laytime now start to run?

Clause 6.3.3 states that if free pratique is *not* granted and the master does *not* serve a Notice of Protest, laytime will not run until free pratique is in fact granted. Failing that, it will start when loading/discharge operations commence. However, it does not say what is to happen if free pratique is not granted but the master does serve a Notice of Protest.

Conclusion

There is no express authority on this point, but on the balance of probabilities, it is likely that laytime will start to run from the service of the Notice of Protest. This should therefore incentivise the master to serve his protest promptly after the six-hour time frame. Of course, if there is ever any doubt over the validity of an NOR, the master should be instructed to tender additional NORs at frequent intervals on a without prejudice basis in order to protect their position.

2 [2004] EWHC 2929 (Comm).

Bills of lading: The Early Departure Procedure and other words of caution

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One of the functions of a bill of lading is to act as a receipt for the cargo shipped. The bill must therefore contain an accurate record of the quantity of cargo carried. This is often more complicated than it may at first appear and this article looks at two of the key issues that can arise.

Introduction

Bills of lading are the cornerstone of nearly all contracts of carriage by sea. Once issued, a bill of lading: (1) acts as a receipt for the cargo shipped; (2) represents the contract of carriage between the receiver and carrier; and (3) is a document of title for the goods in question and, in turn, a negotiable instrument. By virtue of (3), property in the goods being transported on board a ship can be passed from one buyer to another while the sea carriage is still in progress, through what is known as an endorsement on the bill.

The legal issues surrounding bills of lading are vast, as are the international conventions that have been created by the shipping community. These international conventions include the Hague[1] and Hague-Visby[2] Rules and the Hamburg Rules[3].

Ship versus shore figures

All three above-mentioned conventions require that bills contain accurate and true information as to the quantity and condition of the cargo loaded. For example, under Article III Rule 3 of the Hague/Hague-Visby Rules, after receiving the cargo, and on the demand of the shipper, the master is obliged to issue a bill of lading evincing, amongst other things, the quantity of cargo to be carried. A recurring problem many carriers face, especially when loading liquid cargoes, is when the ship and shore figures show different quantities of cargo. Ships rely on their individual tank gauges, often as well as a draft survey, while shore-side terminals and facilities use a variety of different methods to calculate the quantity of cargo provided to a ship. While no method is beyond repute, more often than not, a shore-side terminal/facility will claim it has provided more cargo to a ship than the amount the ship claims to have received.

Refusal to sign

In these circumstances, provided the master has reasonable grounds for suspecting the quantity (or for that matter condition) of the cargo loaded on board the ship is inaccurate, he may refuse to sign the bill of lading 'as presented'. However, if the master unreasonably refuses to sign or authorise the issue of a bill of lading with the use of shore figures, he runs the risk of being in breach of Article III of the Rules and possibly also liable to his charterer (under the subject charter) for any delay and consequent costs/losses down the chain.

Case study

What constitutes a reasonable refusal will, as with all things, turn on the particular facts of the case. However, the English courts handed down some useful guidance in *The Boukadoura*[4]. In this case, there was a difference between the shore and ship figures of about 1%. The master

1 Dated 25 August 1924.
2 Dated 23 February 1968.
3 The full title of the convention is the United Nations Convention on the Carriage of Goods by Sea 1978.
4 [1989] 1 Lloyd's Re 393.

Bills of lading: The Early Departure Procedure and other words of caution continued

was prepared to put both the ship and the shore figures on the bill of lading, but the shippers refused and insisted on the shore figures being used. In an attempt to resolve the dispute, a second draft survey was carried out by an independent surveyor. This confirmed the ship's figures, but the shippers nonetheless still refused to accept a bill of lading showing the ship's figures. Ultimately, and after considerable delay, a bill of lading based on the ship's figures was issued and the cargo was carried to its destination and discharged, without any shortage claim. The charterer subsequently claimed for the time lost due to the delay at the load port. Although the charterparty provided for bills of lading to be issued by the master 'as presented', the court agreed that the master was only obliged to issue a bill lading for the quantity of cargo he *reasonably* believed to have been loaded.

Reasonable refusal

There are no clear-cut guidelines to determine when, or if, a master can reasonably refuse to issue a bill of lading if he considers the quantity of cargo shown on the bill to be inaccurate. Each case will turn on its individual facts and also largely depend on expert evidence (including additional draft surveys). Further, and somewhat irrespective of the law of the subject charterparty, the location and law of the loading port will play an important role in any 'budding' dispute. Therefore, as soon as a master is aware of a problem in this respect, it is vital that he contacts the club or club's local correspondent for advice and guidance (ideally with personal attendance on board) before any dispute escalates.

Other options

Other options available to a master (rather than insisting upon a corrected bill of lading) include: demanding a letter of indemnity (LOI) from the shipper and/or charterer, issuing a letter of protest (LOP) or obtaining guidance from the local court as to the correct quantity of cargo loaded. All of these options have their own shortcomings and, it should be mentioned, club cover implications where a master or member issues a bill of lading with knowledge that it contains an incorrect statement as to the quantity of cargo loaded on board the ship [5].

Early Departure Procedure

Why is it used?

In many terminals, considerable pressure is placed on the ship to leave the loading berth quickly. In such cases, tank gauging and corresponding generation of documentation can often be performed in a hurried fashion and the onus is always on the ship's officers to ensure errors are not made. By definition, an Early Departure Procedure (EDP) normally requires that the ship departs prior to the bill of lading having been issued, and sometimes even before the quantity of cargo on board has been officially determined. EDPs are especially prevalent in the North Sea and the Middle East, and the practice raises a number of factual uncertainties and possible legal liabilities for the shipowner. We deal with these below.

While an EDP is said to be at the option of the visiting ship, in reality there is often heavy pressure on an owner to comply. Terminals are keen to have maximum use of their facilities and minimum delay to waiting ships. Charterers are frequently worried about the effect of delay on discharging schedules, as well as complications with regard to laytime and demurrage. It is known that an EDP is commonly a feature of pre-fixture negotiations and that charterers often seek to use their commercial clout with a view to the inclusion of express provisions stating an owner's acceptance of an EDP and corresponding deductions from laytime for any 'lost' time resulting from an owner's non-compliance with it.

5 See *Rule 3.13(8)*

Who signs the bill?
Following an EDP, the bill of lading is usually signed by the locally appointed agent, on behalf of the master, at some later stage after the ship has sailed the port. The master will usually authorise the agent, in writing, that he may sign the bill of lading on his behalf under certain strict conditions. In this respect, we strongly recommend that an EDP should not be followed unless the master has permission from his commercial operator or the charterer.

Points to note
The master's authorisation to the agent should also be limited to the signing and releasing of the bills of lading only, and be valid only when all details, including quantity/quality of cargo, have first been approved by the master. If possible, the local agents should be required to fax a copy of the (draft) bills to the ship for the master's approval prior to utilising his authorisation to sign and release the bills of lading. Upon receipt, the master would be well advised to check through the drafts very carefully, prior to confirming his approval of the agent's signing them. In particular, when confronted with a draft bill of lading, the master should examine the following aspects (on the face of the bill) and ensure they accurately reflect his own records and information:

i) the quantity of cargo said to have been loaded;
ii) the description and condition of cargo;
iii) the date;
iv) the description of the voyage, including load and discharge port(s).

If the bill is incorrect
If a master or ship's crew subsequently discover that a bill has been issued incorrectly (and hopefully against their strict instructions/written letter of authority), then they must notify their management office immediately. This should also be notified to the member's usual club claims handler as soon as possible, who will then be able to advise the member how best to proceed so as to minimise problems and possible liabilities at the discharge port(s). Such steps may include:

i) giving the consignee, or notify party, on the face of the bill, written notice of the ship's own figures;
ii) issuing LOPs to all interests, including shippers, the charterer(s), charterer's(s') agents, and, if possible, the consignee or notify party;
iii) a request for the shippers to attach a copy of the LOP to the bill and to forward a copy of the protest to the buyers.

Such measures will probably not avoid liability, but may avoid a claim for what will usually be a paper loss.

Cargo shortage
As indicated above, a port/terminal's EDP can sometimes 'push' a ship to anchorage even before the quantity of cargo on board has been properly determined by the ship's crew, by way of tank gauges and draft surveys. If this occurs, then there is no 'benchmark' against which the ship can check the loaded quantity against shore-side figures, and thus there may be no immediate notification to the master of any discrepancy.

It is vital that the implementation of an EDP does not expose a ship to any unwarranted liability caused by, say, an unexpected passage cargo 'loss', in turn attributed to unreliable gauging at the load port shore-side terminal. Whenever a ship and its crew come under commercial pressure to vacate a loading terminal before they have had the proper opportunity to verify the ship's own figures, this must be resisted so far as possible. The use of the vessel's own agents is perhaps one way of avoiding the EDP problem and the pressures involved, although it is appreciated that, with isolated terminals, this will probably be difficult and costly. This must however be compared to the risk exposure of issuing bills with incorrect cargo figures.

Bills of lading: The Early Departure Procedure and other words of caution continued

Conclusion

- Owners should seek to include an express provision in the subject charter stating that an EDP is not accepted, wherever this is commercially possible.
- This charterparty provision should be brought to the attention of the master in order that he can resist commercial pressure from the charterer and its representatives on site.
- Bills of lading are not to be signed until the accuracy of their contents have first been verified and, if necessary, appropriately qualified by the master or the authorised agent of the master.
- Owners willing to take a stance can take heart from the decision of the English courts in the case of *The Boukadoura*. In that case, it was held that, although the charterparty provided that bills of lading were to be signed 'as presented', there was an implied requirement that the bills 'as presented' actually related to the cargo and did not contain a misdescription which was known to be incorrect.
- The use of the vessel's own agents (where commercially and financially viable) is perhaps one practical way of avoiding the EDP problem or the pressures involved in inserting shore-side figures into a bill of lading.
- The member should contact the club as soon as a discrepancy or dispute arises as to ship versus shore-side figures at a load port. The club's local correspondents may be able to send someone to attend on board to assist the master and crew.

Draft letter of indemnity

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There are numerous considerations to take into account when preparing a letter of indemnity (LOI).

While not intended to be exhaustive, some of these include:

- P&I club cover. There are cover implications whenever a master, or member, issues a bill of lading ***with knowledge*** that it contains an incorrect statement as to the quantity of cargo loaded on board the ship (or, for that matter, quality or condition). An LOI doesn't resolve these issues. Instead, such an LOI stands in the place of P&I club cover.
- It doesn't matter how 'watertight' the LOI wording is if the signatory is of dubious financial means. In these circumstances, a bank countersignature is always prudent.
- Careful thought should always be given to the law and jurisdiction clause of any LOI. Think about where the requestor (and its assets) is based and whether it will be easy to enforce an English High Court judgment locally, in that jurisdiction, if enforcement proves necessary. For example, in China, English High Court judgments are unenforceable and it would be better to amend the law and jurisdiction clause of the LOI to read London arbitration. See our earlier publication on this topic on *our website*.

With the above in mind, what follows is a suggested draft LOI capable of being tailored to meet circumstances where a shipper or charterer insists upon shoreside figures being inserted onto a bill of lading, compared to (different) shipside figures.

DRAFT LETTER OF INDEMNITY

[*insert date*]

To: [*insert name of Owners*]
The Owners of the [*insert name of ship*]
[*insert address*]

Dear Sirs

Ship:	[*insert name of ship*]
Voyage:	[*insert load and discharge ports, as stated in the mate's receipts*]
Cargo:	[*insert description of cargo*]
Mate's Receipts:	[*insert identification number(s), date and place of issue of the mate's receipts*]
Bill of Lading:	[*insert identification number(s), date and place of issue of the (TBC) bill(s) of lading*]

Draft letter of indemnity continued

We, [*insert name of charterer/shipper requesting changes*], hereby request you to issue Bill(s) of lading differing from the Mate's Receipts as follows:

To insert the following shoreside figure(s), provided by the [*insert name*] terminal ("Shoreside figures") onto the Bill(s) of Lading, rather than, and in substitution for, the Ship's own figures as to the quantity of Cargo loaded on board the Ship, as stated in the Mate's Receipts:

Shoreside figures: [*insert*]

Ship's own figures (as per Mate's Receipts): [*insert*]

In consideration of your complying with our above requests, we hereby agree as follows:

1. To indemnify you, your servants and agents, and to hold all of you harmless in respect of any liability, loss, damage or expense of whatsoever nature which you may sustain by reason of complying with any and/or all of the above requests.
2. In the event of any proceedings being commenced against you or any of your servants or agents in connection with your complying with any and/or all of the above requests, to provide you or them on demand with sufficient funds to defend the same.
3. If, in connection with your complying with any and/or all of the above requests, the ship, or any other ship or property in the same or associated ownership, management or control, should be arrested or detained or should the arrest or detention thereof be threatened, or should there be any interference in the use or trading of the ship (whether by virtue of a caveat being entered on the ship's registry or otherwise howsoever), to provide on demand such bail or other security as may be required to prevent such arrest or detention or to secure the release of such ship or property or to remove such interference and to indemnify you in respect of any liability, loss, damage or expense caused by such arrest or detention or threatened arrest or detention or such interference, whether or not such arrest or detention or threatened arrest or detention or such interference may be justified.
4. The liability of each and every person under this indemnity shall be joint and several and shall not be conditional upon your proceeding first against any person, whether or not such person is party to or liable under this indemnity.
5. This indemnity shall be governed by and construed in accordance with English law and each and every person liable under this indemnity shall at your request submit to the jurisdiction of the High Court of Justice of England.

Yours faithfully,

For and on behalf of

[*insert name of Requestor*]

The Requestor

.....

Signature

For and on behalf of
[*insert name of bank*]
Bankers

.....

Signature

Demurrage time bars: 'Less is not always more!'

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Voyage charters often include additional rider clauses requiring an owner to submit any claim they may have for demurrage within a prescribed period following completion of loading/discharge operations. This article explains why, where a charterparty makes clear provision as to how demurrage claims are to be submitted by an owner, it is essential that such provisions are strictly complied with.

Introduction

It is common to find additional rider clauses in voyage charters requiring an owner to submit any claim they may have for demurrage within a prescribed period following completion of loading/discharge operations, often within 90 days, failing which the claim is *'deemed to have been waived and forever time barred'*. The prescribed time bars for the submission of demurrage claims are usually the most onerous and time-sensitive an owner will have to comply with, when compared with the time bars otherwise applicable for contractual claims under voyage charters – the default position is six years under English law[1].

The reason behind these clauses is that there are often similar provisions in the underlying contract(s) of sale for the cargo, requiring the charterer to submit their own claim(s) for demurrage within similar, prescribed, tight time frames. Generally, the English courts and arbitration tribunals will uphold these time bar provisions, so long as the wording of the clause is clear and unambiguous. However, the approach has shifted over the years[2], as discussed later in this article.

Earlier case law

Strict compliance with the clause

One of the earliest cases on the subject of demurrage time bars is *The Oltenia*[3]. The relevant rider clause required the demurrage claim to be submitted in writing with *'all available supporting documents'*. The judge held:

'I cannot regard the expression "all available supporting documents" as in any way ambiguous...the owners are in my view shut out from enforcing a claim the substance of which and the supporting documents of which (subject always to de minimis exceptions) have not been presented in time.'

In *The Sabrewing*[4] the owner had failed to produce copies of signed pumping logs within the prescribed 90 days and this was held by the English court to be fatal to the whole of their claim, not just to the parts of their demurrage claim to which the logs related. Here, the judge concluded:

'Clause 23 required owners to present "a claim in writing" within 90 days of discharge of cargo, "together with supporting documentation substantiating each and every constituent part of the claim". Unless such a claim, with supporting documentation, is presented within the relevant time period, charterers are released "from all liability in respect of any claim for demurrage", i.e. not merely that constituent part of the claim that is not supported by relevant documentation.

Accordingly, if, as here, only one composite claim for demurrage was made, owners are time-barred in respect of the entirety of the claim, notwithstanding that the absence

1 John Schofield, *Laytime and Demurrage* (6th edition, 2011), chapter 6.
2 *Eversheds, Demurrage Time Bars – An overview (17 January 2014) accessed 1 May 2015*
3 [1982] 1 Lloyd's Rep 448.
4 [2008] 1 Lloyd's Rep 286.

Demurrage time bars: 'Less is not always more!' continued

of documents only relates to one constituent part of the claim.'

Some have criticised the trend of the above cases, where the courts seem to have taken an overly literal interpretation of the subject time bar clause, without true regard to issues such as materiality. Conversely, it is difficult for a judge or arbitrator to find to the contrary where the wording of a time bar clause is clear and unambiguous and, after all, has been entered into between two commercial parties.

A more flexible approach

An example of the English courts taking a more flexible (and, thus, a more 'owner friendly' approach) can be found in *The Eternity*[5], where the judge held:

'I confess that I find the proposition that a claim put in on time but in respect of part of which the accompanying documents are non-contractual gives rise to a bar to the entire claim is a commercially surprising construction. I am not persuaded that on its proper construction the effect of clause 20 was such that the failure to provide "all supporting documentation" (whether needed by reason of the requirements of clause 19 or otherwise) for one constituent part of the claim discharged liability for the entire demurrage claim.'

In *The Abqaiq*[6], the owner submitted a demurrage invoice, together with 'all supporting documents' within the 90 days prescribed in the charter. However, a dispute arose in relation to an earlier invoice submitted by the owner for bunkers and time consumed at the load port. The charterer argued that the first invoice had to be brought as a clearly stated demurrage claim and that the owner had failed to do so within the 90-day limit. Although the charterer succeeded at first instance, the Court of Appeal overturned the decision on the grounds that the charterer had been put in possession (within the 90-day time frame) of all the factual material which they required in order to satisfy themselves that each and every part of the claim was well founded. They were able to satisfy themselves as to the extent of their liability without the need for the invoice to be marked expressly as a 'demurrage invoice'.

In reaching this conclusion in *The Abqaiq*, the Court of Appeal disagreed with the court in *The Sabrewing* that the requirements under a demurrage time bar clause dictate strict, and absolute, compliance.

Recent case law

The most recent case on demurrage time bars is *Kassiopi Maritime Co v Fal Shipping Co Ltd (M/T Adventure)*[7]. In this case, the ship was chartered on an amended BPVOY4 form. The relevant charterparty provisions read as follows (**our emphasis**):

'19.7 No claim by owners in respect of additional time used in the cargo operations carried out under this clause 19 shall be considered by charterers unless it is accompanied by the following supporting documentation:

19.7.1 the vessel's pumping log signed by a senior officer of the vessel and a terminal representative showing at hourly intervals the pressure maintained at the vessel's manifold throughout the cargo operations; and

19.7.2 copies of all NOPs issued, or received, by the Master in connection with the cargo operation; and

19.7.3 copies of all other documentation maintained by those onboard the vessel or by the terminal in connection with the cargo operations.

20.1 Charterers shall be discharged and released from all liability in respect of any claim for demurrage, deviation or detention which owners

5 [2008] EWHC 2480 (Comm).
6 [2011] EWCA Civ 1127.
7 [2015] EWHC 318 (Comm).

*may have under this charter unless a claim in writing has been presented to charterers, **together with all supporting documentation supporting each and every constituent part of the claim**, within 90 days of the completion of discharge of the cargo carried hereunder.'*

The owner submitted a formal demurrage claim and provided the following documentation in support of the same: a demurrage invoice; a laytime/demurrage calculation for both the load and discharge ports; a Notice of Readiness, a statement of facts and four letters of protest issued at the load port; and a Notice of Readiness, a pumping record, a statement of facts, four letters of protest and an empty tank certificate issued at the discharge port. However, the arbitration tribunal found in favour of the charterer, holding that the owner's claim was time-barred as they had failed to provide the following documents:

(a) the port log and time sheets referred to in the letters of protest; and
(b) a manuscript note from the master, indicating that he had received *'free pratique'* at the discharge port.

The owner appealed to the English High Court, on the basis that the proper construction of clause 20.1 required the owner to provide only 'essential' supporting documentation and not 'all' relevant supporting documentation.

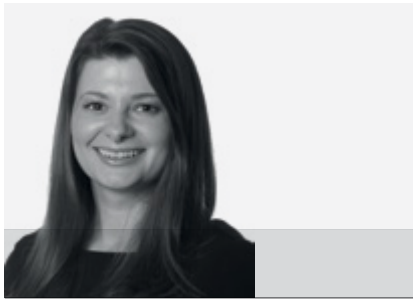
The court dismissed the appeal and agreed with the charterer that the claim was time-barred.

- In particular, the judge ruled that clause 19.7.3 did not require the owner to disclose all relevant documents upfront, as this would place a too far-reaching and commercially impracticable obligation upon the owner. The purpose behind this clause was to focus on *'contemporaneous records kept by vessel relating to the cargo operation'*, which had not been otherwise covered by clauses 19.7.1 and 19.7.2.
- The judge indicated that the case of *The Abqaiq* provided clear guidance as to which documents should be presented in support of a demurrage claim. The judge referred to *'documents which objectively the charterers would or could have appreciated substantiated each and every part of the claim'* and by which they *'were thereby put in possession of the factual material which they required in order to satisfy themselves that the claim was well-founded'*.
- However, clause 20.1 laid an obligation upon the owner to provide ***'all supporting documents'*** in their possession. In this case, the port logs and time sheets were considered *'primary documents containing factual material which should be made available to the charterers so that they may satisfy themselves that the claim is well founded, consistent with the purpose of the clause'*.

Conclusion

While some English High Court cases have indicated a shift towards a more relaxed judicial approach, when it comes to compliance with demurrage time bar provisions, perhaps also more in line with commercial practice, the most recent case of *The Adventure* serves as a timely reminder that where a charterparty makes clear provision as to how demurrage claims are to be submitted by an owner, it is **essential** that such provisions be strictly complied with. Failure to do so could be fatal to the claim. It further underlines the importance of carefully considering and submitting all available documentary material that could be considered evidence, supporting various aspects of a demurrage claim. Overall, when it comes to submitting demurrage claims, the general rule of thumb for an owner should be *'the more documentation you serve in support, the better'*.

Ship-to-ship transfers and withholding consent – the *Falkonera*



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When an owner withholds consent for a proposed ship to receive cargo, the refusal must have reasonable grounds, to avoid a claim. Each case will be decided on its individual facts, but this article explores some of the factors that will be taken into account by the courts when deciding if the owner's decision is reasonable or not.

The facts

In November 2010, the VLCC *Falkonera* was chartered by Falkonera Shipping Company (the owner) to Arcadia Energy Pte Ltd (the charterer) to perform a single voyage carrying crude oil from Yemen to '1-2 ports Far East'. The charterer nominated two VLCC storage vessels to receive the cargo by way of ship-to-ship (STS) transfer at Pasir Gudang, Malaysia. The owner withheld its approval of the proposed VLCCs and therefore the cargo was discharged into smaller vessels.

The owner claimed demurrage, but the charterer denied liability for demurrage and instead advanced a counterclaim on the basis that the withholding of consent by the owner was a breach of the charterparty which led to delay and increased costs.

The charterparty terms

Part 2 of the standard BPVOY4 form (clause 8) provided:

'8.1 Charterers shall have the option of transferring the whole or part of the cargo... to or from any other vessel including, but not limited to, an ocean-going vessel, barge and/or lighter (the "Transfer Vessel")... All transfers of cargo to or from Transfer Vessels shall be carried out in accordance with the recommendations set out in the latest edition of the "ICS/OCIMF Ship to Ship Transfer Guide (Petroleum)." Owners undertake that the Vessel and her crew shall comply with such recommendations, and similarly Charterers undertake that the Transfer Vessel and her crew shall comply with such recommendations. Charterers shall provide and pay for all necessary equipment including suitable fenders and cargo hoses. Charterers shall have the right, at their expense, to appoint supervisory personnel to attend on board the Vessel, including a mooring master, to assist in such transfers of cargo.'

By way of specific addition to Part 1, the charterparty contained the following clauses headed 'STS lightering clause':

'If charterers require a ship-to-ship transfer operation or lightering by lightering barges to be performed then all tankers and/or lightering barges to be used in the transhipment/lightering shall be subject to prior approval of owners, which are not to be unreasonably withheld... all ship-to-ship transfer operations shall be conducted in accordance with the recommendations set out in the latest edition of the ics/ocimf ship-to-ship transfer guide (petroleum).'

The Commercial Court's decision[1]

The owner argued that, on a true construction of the above clauses, VLCC-to-VLCC transfers were not permitted; therefore, it had acted reasonably in withholding its approval, because VLCC-to-VLCC transfers were non-standard and they had

1 [2012] EWHC 3678 (Comm).

concerns about the STS operation itself. The Commercial Court, however, decided that the owner had withheld its consent unreasonably.

The court decided that the wording in clause 8.1 was wide enough to permit a VLCC-to-VLCC transfer. From past experience, the owner had concerns about VLCC-to-VLCC transfers and, as a company policy, did not allow it. The charterer's expert had, however, been able to demonstrate that the owner's objections were specific to the previous incident and were not sufficient grounds for a reasonable shipowner to decline approval in the present case. The owner's right of approval was limited to the right to review the details of the nominated vessel and to decide whether or not she was suitable for the proposed STS operation rather than approval of the STS operation itself.

The court also held that the absence of a section in the OCIMF Guide (in its then form) dealing with VLCC-to-VLCC transfers did not mean that such operations could not (with advance planning) be conducted in accordance with the Guide.

The Court of Appeal[2]

The owner appealed the Commercial Court's decision, but the Court of Appeal agreed with the previous judge's findings. The Court of Appeal accepted that a VLCC-to-VLCC transfer may not have been a standard operation, but this did not mean that the owner's refusal was reasonable.

The owner was required to approve the vessel and not the STS operation itself. Such an approval was not to be considered in isolation, but in the context of the operation contemplated. However, the above clauses did not allow owners to vet the plans for the STS operation before deciding whether to approve the nominated vessel.

Case comment

Since the first trial, a new edition of the OCIMF Guide has been published dealing with STS transfers involving vessels of a similar length.

What is apparent from this decision is that owners must act reasonably in considering any requests to perform STS transfers. This case will be welcomed by charterers, but each case will be decided on its individual facts. The case gives owners some guidance as to what factors will be taken into account by the courts when deciding if an owner's decision is reasonable or not.

2 [2014] EWCA Civ 713.

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