

Quality Concept *for* Reefer Cargo

This article, takes a look at the 360 Quality Code and Zero Damage of Reefer Cargo as a concept - and the way it helps in minimizing losses in the reefer cargo supply chain. The end result is availability of better quality products at the bottom of the chain viz, the end consumer.

- C.Maheshwar

In this article, we take a look at 360 Quality Code and Zero Damage of Reefer Cargo as a concept and the way it helps in minimizing losses in the reefer cargo supply chain. The end result is availability of better quality product at the end of the chain viz., the end consumer. It encompasses the activities of all the members in the cold chain with several quality checkpoints all along the chain. These concepts are particularly applicable to carriage of reefer cargo in bulk in reefer cargo holds of reefer vessels as part of the cold chain.

The 360 Quality Code

The 360 Quality Code is a set of voluntary standards for specialised reefer shipping lines and their service providers. The aim is to meet the needs of our customers by promoting the highest standard of quality and cargo care; on reefer vessels, in port terminals and in liner trades. The Code recognises that the specialised reefer shipping lines and their service providers have to work jointly to achieve this goal. The 360 Quality brings transparency in the supply chain of perishables and the principle is that in a collaborative supply chain everyone involved should assume responsibility for their activities and take corrective action to eliminate defects.

The main features are:

- Implementing practices and using equipment in terminals and ships that will prevent damage to cargo
- Uniform way of establishing damage and following an agreed action plan when damaged cargo or cargo with exceptions is presented to the terminal and ship

- Uniform way of recording exceptions at reception, loading, unloading and delivery of cargo.
- Establishing local working procedures for ports of loading and unloading which are compatible with the requirements of the Code
- Establish quality teams in ports who will analyse the damages their cause and introduce preventive measures
- Provide feedback upstream in the supply chain

Specialised Reefer Shipping Association (SRSA)

A group of specialised reefer operators including Great White Fleet Ltd, Green Reefers ASA, NYKLauritzenCool AB, Seatrade Group N.V., STAR Reefers Ltd. (Blue Star Line) and Universal Reefers Ltd./Cape Reefers formed this association in 1999 and launched the 360 Quality concept in late 2006. The members presently represent about 25% of the world reefer operators who have fully endorsed 360 Quality Code. About 15 port terminals are in the process of endorsing the code and becoming members of the 360 Quality Association..

360 Quality Association

A body dedicated to improving Food Safety and Food Quality in the specialised reefer shipping has been formed. The main task of this body is to develop guidelines for the implementation of the 360 Code and develop it further to meet the needs of the market. Since compliance with 360 Code requires audits by independent bodies, the 360 Quality Association has developed Uniform Guidelines for auditors and certification bodies that will audit the terminal and ships. A

collective logotype is connected to the 360 Quality Code and will be used by all ships and terminals belonging to the specialised reefer shipping mode that adhere to the requirements of the Code

Certification and control are important elements in the use of the 360 Quality Code logotype.

Classification societies and other accredited bodies that meet the approval of the 360 Quality Association will certify the shipping lines and the port terminals according to certification procedures.

Main areas for the 360 Quality Code

Requirements concerning protection against damages caused during the transportation and handling of the cargo in the ship are:

- Training of crews
- Prevention of ingress of seawater
- Prevention of contamination of cargo
- Strength and maintenance of gratings
- Strength and maintenance of sideshorings
- Proper stowage and securing of cargo

The 360 Quality brings transparency in the supply chain of perishables and the principle is that in a collaborative supply chain everyone involved should assume responsibility for their activities

|| reefer cargo care ||

- Proper cleaning routines
- Use of weather routing

Requirements for terminals and stevedores are:

- Training of staff engaged in handling fruit
- Use of proper equipment for handling the cargo
- Compliance with Hygiene standards in CODEX
- Prevention of contamination of cargo

Checkpoints in the supply chain

The Code requires that checkpoints are established in the supply chain to monitor the condition of the cargo and prevent damaged cargo from coming onboard and recording accurately the exceptions at the time of delivery. The terminals and stevedores record the exceptions at the checkpoints in a properly structured database which permits one to analyse the exceptions and follow the Six Sigma method for improving quality.

Feedback to partners in the supply chain

The Code lays down the conditions for inspection and recording of exceptions, for measures taken, and communication to everyone involved of the results - all in a uniform way and by using properly structured data. This makes the transport process transparent and provides a firm base for taking corrective action at one or more points in the supply chain.

What is Zero Damage?

Zero Damage is a mindset in which we develop respect for the products we carry along with the livelihood of all partners in the production and supply chain. Acts

like people walking on pallets of mangoes, grape pallets getting squeezed by adjacent pallets, required temperatures are not maintained are all examples of improper care of reefer cargo. Zero Damage is an industry standard adopted by SRSA (Specialized Reefer Shipping Association) members and is a part of 360 degree Quality Initiative of SRSA. It motivates people to take care of the cargo all along the way. Procedures have been clearly spelt out so that the cargo is handled economically, efficiently, professionally and carefully. Checkpoints in the supply chain ensure that responsibility is handed over smoothly removing any ambiguity and enhancing transparency.

Whenever any cargo damage occurs, answers are sought as to WHY, WHERE and WHEN the damage had occurred reinforcing the commitment "Whoever is responsible for damage is accountable for the damage".

Zero Damage is a drive against reefer cargo claims and aims to enhance Customer Satisfaction. It reminds about respect for cargo and equips the crew members with the knowledge and expertise in

cargo care, Reefer Cargo losses have been reduced substantially by use of Zero Damage Concept.

Food Safety and Hazard Control

Food products have to be maintained fit for human consumption which needs high standards of hygiene and cleanliness of cargo holds. Strict Food Safety and Hazard Control standards have to be adhered to ensure safety and quality of the cargo. Ships crew's involvement is very important to attain a defect free seamless perishable supply chain thus ensuring food safety and delivery of perfect cargo to the end customers.

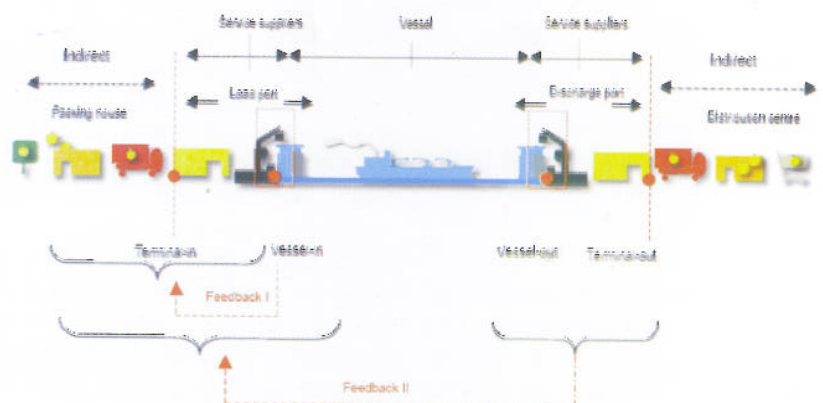
The Reefer Cargo Supply Chain

The Supply Chain

The supply chain describes the process of the transportation of cargo from its origin to its final destination by several partners.

Documents

A document called Supply Chain Procedure containing the detailed procedures what each partner does in the supply chain is issued. Based on this document, a Zero damage working procedure is



The Reefer Cargo Supply Chain

established for all loading and discharging ports in the Zero Damage trade. The Supply Chain Procedure is a document that lists the tasks, duties and authority of all the partners involved in the supply chain. These various elements may be different from trade to trade and must be discussed and agreed upon for each Zero Damage trade.

Responsibility of Cargo

It lays down exactly where the responsibility of the cargo is handed over from one partner to the next partner in the supply chain avoiding any grey areas resulting in ambiguity. This creates transparency of operations all along the supply chain. The Supply Chain Procedure is signed by all the partners in the supply chain when they agree to

work according to the Zero Damage principles. All partners must strive to achieve quality by adopting good working methods. With an agreed Supply Chain Procedure in place, it is possible to measure damage in a uniform way and make corrections as required. Feedback can be provided to the partners to improve performance.

Checkpoints

The Supply Chain Procedure specifies various checkpoints in the supply chain where damages are recorded and responsibility is handed over from one partner to the next one. Different trades have different checkpoints

In general, there are six Checkpoints

- Checkpoint Terminal-In (Loading Port)
- Checkpoint Terminal-Out (Loading Port)
- Checkpoint Vessel-In
- Checkpoint Vessel-Out
- Checkpoint Terminal-In (Discharge Port)
- Checkpoint Terminal-Out (Discharge Port)

Partners of the Supply Chain

The various partners who can influence the supply chain are:

1. Farmer

Being his livelihood, the grower/farmer takes very good care of the cargo. Regular quality checks will be carried out during the various stages of the growing or production process.

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2. Packing Station

The second quality check is carried out at the Packing Station. The cargo is packed, crated, palletised and loaded onto the truck. The truck transports the product to the terminal at the load port.

3. Checkpoint Terminal - In

On reaching the terminal at load port, the truck driver hands over the responsibility to the terminal. The Terminal checks the quality and quantity of the cargo before accepting it. Unsuitable cargo will be rejected and the reasons of rejection discussed with the shipper.

4. Checkpoint Terminal - Out

Here, the responsibility of the cargo is handed over by the terminal to the Stevedore. It is the responsibility of the stevedore to ensure the cargo is handled carefully and loaded onto the ship in good condition. Stevedore will be responsible for any damage to the cargo due to mishandling while loading onto the ship.

5. Port Captain

Assists the ship's Master and crew in safely loading the cargo on the vessel with Zero Damage. He coaches and instructs the stevedores according to Zero Damage principles and optimum

stowage methods. In spite of the presence or guidance of the Port captain, it is the vessel which is finally responsible for the cargo.

6. Vessel Checklist

The Vessel checklist should be followed for preparing the cargo holds. The vessel's staff should check the cargo arriving alongside the ship and ensure that Zero Damage Control inspectors are diligently following the cargo rejection criteria.

7. Checkpoint Vessel - In

This is defined as in the vessel after all the handling by the stevedores at the final point of the stow in the hold. At this point, the vessel takes responsibility of the cargo. The cargo will be tallied and the cargo condition will be verified.

8. Voyage

During the voyage, the cargo is in the hands of the ship's crew. Vessel must ensure that cargo maintains its fresh and undamaged condition. This is done by carefully monitoring the cargo temperature throughout the voyage and safe navigation to the discharge port.

9. Checkpoint Vessel - Out

This is defined as "In the vessel before any handling by stevedores, at the original point of stow in the hold". Here, the stevedore must check the cargo for any damage before commencing to discharge from the vessel. Damaged cargo is logged in the Damaged Cargo Exceptions Report countersigned by the Master or Chief Officer.

10. Checkpoint Terminal - In

Here, the responsibility of the cargo is handed over by the stevedore to the Terminal. The quality and quantity of the cargo is

checked for before it enters the terminal.

11. Checkpoint Terminal - Out

Before the cargo leaves the terminal, it passes through this checkpoint. The terminal hands over the responsibility to the truck driver. The truck driver checks the quality and quantity of the cargo before accepting it.

12. Supermarket

The truck driver takes the cargo to its final destination point which may be a supermarket or a local grocery store.

13. End Consumer

Equipment used in Zero Damage Control Process

The Equipment used for Zero Damage Control comprises of Stevedore's Equipment which consists of: Pallet Cages, Pallet Jacks, Forklifts, Pallet Spreaders and Slip sheets and Ship's Equipment which consists Cranes, Walking Boards, Slings, Air bags, T bars etc.

Pallet Cages or Pallet Platforms are used to move the cargo from the quay to the vessel. They may be having either two pallets or four pallet capacity. The type of pallet cage is determined by the crane capacity and space available in the hatch square. Pallet cages are preferred over C hooks because of higher efficiency and lower damage risk.

Pallet Jacks may be used along with forklifts to stow the cargo in the right place inside the cargo hold. If hydraulic or battery operated equipment is used, it must be ensured that the hydraulic oil or battery acid should not leak. Use of pallet jacks minimizes the risk of

Pallet Cages or Pallet Platforms move the cargo to the vessel. They may have either two pallet or four pallet capacity, determined by the crane capacity and space available in the hatch square.

cargo damage. Pallet jacks must have sufficient wheels for smooth movement. When using pallet jacks, all the deck surfaces should be absolutely even to prevent pallets toppling over during movement. The surface of Spar decks should be absolutely smooth. When not flush, the small wheels of pallet jacks will wear out the edges of the wooden beams. This causes further damage to the wooden beams with the result that dirt and splinters can fall on the cargo situated below.

Forklifts used must be lightweight, easy to maneuver and should have semi-pneumatic or pneumatic tires. Drivers should be well trained. Forklifts should be

fitted with pallet protectors on the vertical face of the tines. The tines of forklifts and pallet jacks should not protrude beyond the end of pallet base. A tine width of 10 cms is recommended for larger load sharing area. The gratings must be steady and properly supported by the wooden supports.

Pallet Spreaders should always be used when loading pre-slung pallets, to prevent slings cutting into the top tiers of the cargo cartons. Spreaders should be of the right size; too large spreaders may cause the pallets to fall over and too small spreaders will crush the cargo. Spreaders may be of one, two, four or six pallet type. Spreaders must keep the pallets

close to each other without any gap at the top or bottom of the pallets. Same type of spreader should be used at the loading and discharging ports. Any non-usage of pallet spreaders by the stevedores must be reported as it may cause cargo damage. If not pallet spreaders are available, an empty pallet base placed at the top of the pallet will protect the pallet from compression damage.

Slip sheets protect the adjacent pallets from damage when lowering the last pre-slung pallets in a tight stow. Air bags should not be used for this purpose. They may be sometimes left in the cargo hold along with the cargo depending upon the cargo trade. In such cases, they

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Slings and Walking Boards

also help in preventing damage when removing the first few pre-slung cargo pallets from a tight stow.

Cranes which may be ship's cranes or shore cranes. Ships cranes must be kept in good working condition. Damage to ship's cranes is a great possibility due to inexperience of the shore personnel. Stevedores must be well instructed about use of ship's cranes and other equipment. If found cranes being not operated properly, insist on changing the operator.

Walking Boards must be made available before starting of loading or discharging. They should be light and easy to handle by the crew or stevedores and must be used whenever walking on cargo is required. They spread the weight of the person equally all over the board to avoid pressure damage and footprints on the cargo which becomes very important from food safety point of view. After

completion of cargo, must be collected and properly stored. They must be cleaned after every usage and must not be left behind inside the cargo hold.

Slings

In each compartment, at least 16 pallets have to be pre-slung and 24, if forklifts are to be used for discharge to give enough operating space in the hatch square. Identical slings of equal length and SWL should be used.

Airbags when used must be correctly positioned and inflated. They must be filled for a maximum opening of 30 cms. Bigger openings will cause excessive pressure on the airbags. Never place two or more airbags in one single large opening. If required, the pallets may be shifted to create openings of smaller sizes. Damaged airbags must be removed and rejected after every use. Airbags should be placed as close to the ship's centre line as possible to avoid unequal pressures. Always consider the possibility of airbags getting deflated and collapsing causing pallets to shift. Minimize the number of airbags by proper stowage and turning some pallets.

T Bars are used to lash pallets in partly loaded compartments. On spar decks, lashing is secured to

the deck by T hooks between the beams. Plywood or special pallet protectors have to be put between the T bar and the cargo to prevent pressure damage. Failure to lash the upper part of the T bar results in its bending during the course of the voyage due to external forces. On grating decks, lashing is secured to the deck by S hooks in the grating holes. T Bar is placed at an angle between 30 and 60 degrees with one end against the cargo and the other end against the deck. 45 degrees is the most preferred angle. The web lashings must be drawn from the top of the T bar onto the deck.

Pre-Loading Activity

Originally, Zero Damage projects focused on liner trades limited to palletized fruit cargoes. However, Zero Damage principles apply for all types of reefer cargoes including bins, boxes, crates, drums, big bags etc.

Cargo Booking - In case of a time charter or voyage charter, the charterer is responsible for cargo bookings. In case of a liner voyage, the booking agent books the reefer cargo in consultation with the shipping line. Sometimes, there are seasonal bookings or tramp spot fixtures. Cargoes are listed in the booking list which is continuously updates and communicated to the shipping line.



Reefer Cargo Hatch Preparation

Operator - In the office, the most appropriate vessel is scheduled and is informed and instructed by the operator. As the vessel proceeds towards the load port, cargo is harvested, packed and prepared for transported.

Checkpoint Terminal - In From the packing station, trucks will usually transport the pallets to the terminal. The terminal coordinates which truck and cargo is called forward into the terminal based on the vessel's stowage planning. At the packing station, the truck driver signs his Bill of lading for receipt and good order. Upon discharge, the truck driver hands over the custody of goods at the checkpoint Terminal-In. At this checkpoint, the terminal verifies the quantity and quality of the cargo.

Quality Control at the Terminal works like a traffic light. Illumination of Red implies damaged cargo unfit for transportation or consumption and its rejection. Illumination of Amber light indicates damaged but repairable or replacable cargo and another action like repair or replacement has to be carried out before the cargo can be accepted. Damage has to be recorded as per the Standard Damage Code before passing the green light. Illumination of Green light indicates cargo is in acceptable condition.

Preparation of Cargo holds

As soon as the ship leaves the discharge port of the previous cargo, the Chief officer instructs the crew how to prepare the cargo holds for receiving the next cargo. The preparation involves thorough cleaning of Cargo holds using appropriate methods to fulfill the requirements. In general, cargo holds must be clean, dry and smell free. After each voyage, sweeping and removal of cargo residues, dirt and debris must be carried out meticulously. Scuppers, drains and bilges must be hand cleaned and checked lifting the gratings and brooming if necessary. Excess grease and dirt must be removed from the hinges of the hatches. The roller guides of hatches must be cleaned and made free of loose rust. Cargo holds must be washed thoroughly using fresh water and special detergents for disinfection. All surfaces must be washed with a deck scrubber and followed by high pressure washing. Strong smells from previous cargoes should be eliminated and cargo holds should be thoroughly dried by ventilation and deodorizing. Cargo holds are re-checked one day before arrival at the load port. Details of cleaning of cargo holds must be recorded in the ship's log book

Cargo worthiness

The ship owner is obliged to make sure the vessel is in all

respects fit to receive the contractual cargo. The ship may be suitable for certain types of cargo but unsuitable for others needing certain actions to receive the other types of cargo. The ship should be cargo worthy at the time of loading and must be ready to face the ordinary perils encountered during the loading stage.

Pre-loading meeting Before loading starts, there will be a pre-loading meeting with different partners to discuss the loading operation and the local Zero Damage procedure in the port. The meeting will be attended by the master, chief officer, the stevedore foreman, zero damage inspection team and the port captain if present. This document will be brought on board by the terminal or stevedore foreman and is to be signed by all partners before cargo loading begins.

Agenda of the meeting comprises of the following items:

- The local Zero Damage procedure
- Procedure for checking pulp temperatures before loading
- Use of Zero Damage equipment for loading
- Communication during loading-VHF, mobile phone etc.
- Working Hours
- Stowage Methods and Stowage plan



Reefer Cargo Hatch

- Loading sequence of various cargo parcels with different temperatures and different destinations.
- Different packings and pallet types
- Part loading of any compartments requiring lashing of cargo
- Loading and lashing of deck cargo

Local Zero Damage Procedure

The port captain or the stevedore foreman will inform the master and the chief officer about the local Zero Damage procedure. They will discuss the procedure for checking the quality and quantity of the cargo. A clear line of communication has to be established and there should be an absolutely clear understanding as to who should be contacted in case of a disagreement. After the meeting, the master or chief officer should brief all the other officers, engineers and crew members about the relevant details of the loading operation.

In order to apply the Zero Damage principles, the terminal and stevedores must follow the concept of the load port procedure. Per trade, this load procedure is updated depending upon the local working methods.

Any cargo which is damaged and found not in a condition for ocean transport will be identified and returned to the terminal for repairs or replacement.

Load Port Procedure

Walking boards will be used at all times if walking on cargo is necessary, particularly during pre-slung operations in the hatch square. Pre-slung cargo must be loaded with an adequate pallet spreader and handled without causing any damage. Slip sheets must also be used. Pallets with display cartons, IFCO trays or bins are not to be used for pre-slung operations and should not be stowed in the hatch-square. All slings used must be of the same length and type. Airbags must be placed near the centre of the rows.

The terminal and Zero Damage inspection team will inspect the cargo presented under hook for damages. The Zero Damage inspection team will also inspect the cargo in the holds for damages that occurred during loading into the ship. Any cargo which is damaged and found not in a condition for ocean transport will be identified and returned to the terminal for repairs or replacement. Particulars of the rejected cargo must be noted. In case the terminal/stevedores and the Zero Damage Inspection team are in doubt regarding the status of the cargo, the chief officer or his representative shall always be requested to inspect the cargo and his advice is to be followed. If the cargo is lightly damaged and accepted by the ship, the particulars of the cargo and the damage shall be noted according to the Standard Damage Code and listed on the Zero Damage Control (ZDC) Record.

Checking the Cargo

To check the cargo quantity, the vessel's staff has to tally the number of items being loaded onto the ship. Sometimes, private tally clerks are employed to assist the ship's staff.

Cargo quality will be checked as per AC/DC criteria. COMMON SENSE is often the best tool to judge the cargo condition.

- AC-apparent good order and condition. This implies reasonable checking of the cargo by sight and smell. There is no abnormal smell or visual deficiency (like mould) and the pallet construction is sound and is fit for sea transport.
- DC- damaged condition. The cargo appears to be damaged after reasonable checking of the external condition. Damaged cargo that cannot be loaded must be rejected. Any cargo that is not in apparent good condition but can be loaded must be recorded as per the Standard Damage Code.

Cargo Stowage

Always plan stowage thoroughly before loading. Always supervise loading and stow the cargo as tightly as possible. In square compartments, start loading on the side of the compartment where the cooler room is located. This is important if broken stowage occurs. In non-square compartments (hold#1) start loading from the narrow side of the compartments. The first loaded pallets should be stowed in the corners and then continue towards the centre line. The longest side of the pallet must be stowed parallel to the centre line of the vessel in the fore-aft orientation. Stowage must begin from the forward (1/2) or aft (2/1) part of the hold and proceed towards the hatch square. Then continue with the port (3) and starboard (3) proceeding towards the hatch square. Hatch square (4) must be taken up the last. Always keep sufficient clearance at the return air screen openings. Always keep sufficient clearance at the top of the

|| reefer cargo care ||

cargo to allow proper air circulation. Always make proper, correct and optimum usage of air bags.

Stowage in the hatch Square

Pallets with display cartons with open tops, IFCO trays or bins are preferably not pre-slung, and should not be stowed in the hatch square due to difficulty in discharging. Always work towards a stow that leaves a square of 4 X 4 pallets plus one foot in the centre.

The stowage in the hatch square ends with air bag formation in the cross. Cross stowage is preferred because of easier discharge of pre-slung cargoes. Slipsheets are to be used when pre-slung pallets need to be

placed in tight stowage positions.

Broken Stowage

If the cargo holds are not fully loaded, the cargo must be restowed in the forward or the aft part of the hold. Avoid a large amount of pallets in a transversely broken stow. It is preferable to avoid a broken stow at a forward most hatch due to the additional forces present. Maximum Securing Load of the slings must always be considered before usage.

Temperature Sensors

USDA temperature sensors must be used in perishable cargoes being loaded. Frozen cargoes do not need these sensors. Place the sensors at all the areas uniformly

from midway to the top of the load. Always verify that the sensors are positioned correctly in the airflow path. Ensure that these sensors are not tampered or damaged due to mishandling by the stevedores. Clearly mark the position of the temperature sensors with stickers so that they can and will be removed by shipstaff during the cargo discharge. A sensor location plan needs to be prepared showing the actual location of each sensor in various compartments This plan needs to be sent to the operator.

Preparations for the Loaded Passage

We need to know the following
What happens ashore during



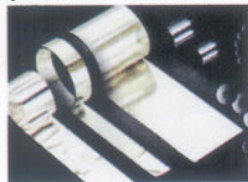
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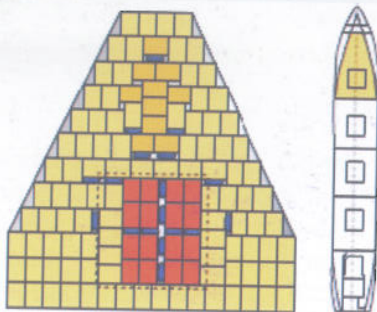
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Cargo Storage

- Have bilges been sounded and emptied?
- Is cargo properly lashed as per the Cargo Lashing Manual?

Vessel Seaworthiness

The vessel must be suitably manned and equipped to meet the ordinary perils likely to be encountered while performing the services required. This covers not only the physical condition of the vessel, but also the competence of the crew members and adequacy of stores and documentation. A defective engine, or an inoperative compass may render the vessel unseaworthy, so may improper cargo lashing which can affect stability. As it is not a continuous warranty, the vessel should be seaworthy at the time of sailing. Any defects that occur during the course of the voyage do not render the vessel unseaworthy.

Terminal at the discharge port

The terminal plans the discharge of the cargo from the vessel according to the final stowage plan and the requirements of the cargo receivers like fruit size, commodity, variety, temperature, pallet ID, size etc. The agent keeps all the partners in the supply chain informed.

Cargo Care during the voyage

During the voyage, the vessel's staff must fully focus on, anticipate and care for and maintain Zero Damage condition of the cargo. All combined efforts from the ship's staff are required to achieve this goal. Carrying instructions must be meticulously followed.

Carrying Instructions can have the following content:

Specific instructions regarding shock treatment required, if any, delivery air temperature

instructions, time, duration and Quantity of fresh air requirement, maximum permissible CO2 level, speed of circulation fans etc.

Role of Engine department

All engine watchkeepers must be aware of the carriage instructions. Requirement of different temperatures in different cargo holds and compartments should be written down clearly in the stowage plan and understood to avoid mistakes. Orders regarding cargo monitoring issued by Chief Engineer should be clearly understood by all watchkeepers. Any irregularities in temperatures or CO2 levels should be immediately reported to Chief Engineer. Engine Department must maintain proper temperature records in reefer log and datalogging printouts.

Role of Deck department

It has the responsibility of taking care of the cargo. It has to keep an accurate logbook with relevant information such as position, course, speed, weather conditions, bilge soundings, ballasting and deballasting routines and cargo checks (lashing and physical checks whenever possible). It is very important that relevant entries are made in the vessel's log books. To verify the cargo condition the master should send a daily temperature report in the format as per the company's manuals. The temperature report should be sent every noon from the time the first cooling section is closed in the first port of loading till the time the last cooling section has been opened in the last port of discharging.

The Daily temperature noon report may contain of the following

the sea voyage? What are the interactions between the ship and the operator? What is the importance of crew's involvement during the voyage?

Vessel Checklist before departure

- Are cargo carrying instructions clear to everybody on the ship?
- Has a temperature location plan been prepared?
- Have all lights in the cargo holds been switched off after loading?
- Are the hatches and watertight doors fully closed?



Role of Engine Department

information:

Temperatures, CO2 percentages, relative humidity, speed of circulation fans, fresh air status, sea water and ambient temperatures, last defrosting cycle and any other information which may affect the cargo condition. The operator checks the daily temperature reports against the carrying instructions.

Careful Navigation

In addition to good cargo care, careful navigation is also important. The vessels must be equipped with adequate quantity of navigation equipment and aids. The vessels should navigate carefully using modern facilities like weather routing, GPS etc. Weather Routing improves efficiency through lesser cargo damage, lesser vessel damage, better reliability in cargo delivery, shorter transit times, better ETA notices, better logistical planning and lower bunker consumption. Zero Damage

condition of the cargo should never be compromised at all. Adjustment of speed and route including sea stoppage is permitted if weather condition demands. It is better to arrive a little late with good cargo than arrive early or in time with damaged cargo. Any deviation in speed or ETA should be immediately reported to the operator. Vessel's Position Reports to the Operator consists of the following information: Departure Report, Arrival Report, Anchoring on arrival pilot station and Position Report with Noon position, Speed and Speed Instruction, Fuel Consumption, Weather and ETA next port.

Discharging the Cargo

We should know what are the preparations required before cargo discharge and how to discharge the cargo under Zero Damage principles.

Checklist of Items for Port Planning comprises of Bunkers, Stores, Crew Changes, Maintenance and Repairs, Surveys, Inspections, Audits etc., Replenishment of cargo handling materials and spares for reefer equipment and Owners and local official's visits

Arrival at Discharge Port

Before entering the discharge port, vessel should liaise with agents, port captain, charterers, owners, operations and bunker departments regarding the port planning. Port security should be checked, with awareness about berthing and discharge prospects and a feasible plan is worked out. Avoid peak loads, spreading activities throughout the port stay and even out the workload. The

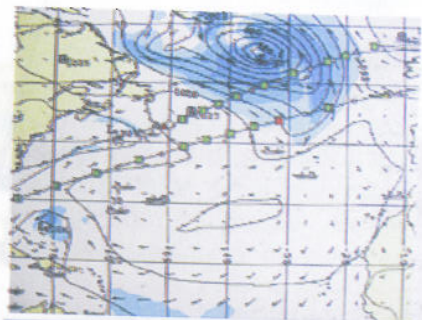
entire ship staff should be aware of the port planning. Planning may be done for lashing removal during pilot age, river navigation or idle in the locks.

Pre Discharge meeting

Before discharging starts, there will be a pre-discharge meeting with different partners to discuss the discharging operation and the local Zero Damage procedure in the port which must be attended by Master, Chief officer, Stevedore Foreman and Port Captain if available. The Agenda of the meeting will comprise of Local Zero Damage procedure, Zero Damage Equipment, Communication, Broken Dunnage and lashing and Back loading or lashing of any cargo

Local Zero Damage procedure

The port captain or the stevedore foreman will inform the master and the chief officer about



Weather routing and Careful Navigation



Discharging the Cargo

the local Zero Damage procedure. They will discuss the procedure for checking the quality and quantity of the cargo. A clear line of communication has to be established and there should be an absolutely clear understanding as to who should be contacted in case of a disagreement. This document will be brought on board by the terminal or stevedore foreman and is to be signed by all partners before cargo discharging begins.

Preparations for Discharge

The vessel will not discharge unless walking boards are used. No walking is to be permitted on bare cartons or fruits. Adequate pallet spreader should be available to discharge pre-slung

pallets. Cargo damage must be established by the stevedores and marked with colored stickers with sequential numbers. These marked pallets should be kept in a special area and inspected. Damages should be noted as per Standard Damage Code and listed in Zero Damage Exception Record, which will identify those damaged by stevedores and those found damaged in the hold. Good supervision by the ship staff during discharging operations prevents unnecessary disputes as to who caused the damage - stevedores or ship. After completion of discharging, Zero Damage Exceptions Report will be issued, signed and forwarded to shipping line and port agent.

Checkpoint Vessel - Out

This is defined as "In the vessel before any handling by stevedores, at the original point of stow in the hold". Here, the responsibility is handed over from the vessel to the terminal. The cargo is checked by the terminal using AC/DC system.

AC-apparent good order and condition which means reasonable checking of the cargo by sight and smell. It implies that there is no abnormal smell or visual deficiency (like mould) and the pallet

construction is sound and is fit for sea transport.

DC- damaged condition which means that the cargo appears to be damaged after reasonable checking of the external condition. Any cargo that is not in apparent good condition but can be discharged must be recorded as per the Standard Damage Code. The particulars of the cargo and damage shall be noted according to Standard Damage Code and noted on the Zero Damage Exceptions Record which will identify pallets which were damaged in the holds and those damaged by the stevedores during discharge.

Cargo Inspection

Checking of the cargo has to be done in the cargo hold because that is the place where transfer of responsibility takes place from the ship to the terminal or the stevedore. However, it is not possible to check all damaged cargo like broken pallet base on a pre-slung pallet. Practical checking of the cargo is done as per local Zero damage procedure.

Signing Damage Reports

After completion of the cargo discharging, the terminal will

Checking of the cargo has to be done in the cargo hold because that is the place where transfer of responsibility takes place from the ship to the terminal or the stevedore.

present a copy of Zero Damage Exceptions Report for signing which will be in turn forwarded to port agent and the shipping line. Blank or code unspecified damage reports should not be signed. Vessel's staff should sign only for cargo damage which existed before discharging from the hold. Never sign for stevedore damage to the cargo.

Never sign for a pallet which got damaged by falling inside the hold or on the quay during discharging by stevedores as the damage has occurred after the stevedores took the responsibility of the cargo.

Responsibility

The vessel is responsible for the cargo damage that was not noted in the load port but is found in the cargo hold before discharge. In case of major damage, the operator, P&I club and the owner or manager of the vessel should be contacted.

During the pre-discharge meeting, the master and the stevedores must co-ordinate the proper sweeping, blowing and cleaning of the tween decks (mainly wood splinters and cardboard pieces). Rust, dirt and debris is to be swept or blown clear of the hatch covers with compressed air before hatch cover opening.

Where tween decks do not have removable gratings, a blow pipe can be fitted with an air diffuser head that directs the air flow. The blow pipe is inserted through the openings in the gratings and the airflow can be steered to blow the debris in the intended direction.

Discharging the Cargo

Ship's officers and crew must

be on the deck and inside the cargo holds to supervise the discharge operations stevedores. Stevedores should use the right equipment both at the loading time and also during discharging time. Walking boards must be available before discharging pre slung pallets and must be used when it is required to walk on the cargo. Stevedores must always use walking boards during the discharging operation.

When discharging pre-slung pallets, a pallet spreader should always be used to avoid damage to the cargo due to pressing or crushing. To avoid handling damage, the same type of spreader should be used at the loading port and also discharge port.

Checkpoint Terminal - Out

Before the cargo leaves the terminal, it passes through Checkpoint Terminal-Out. The terminal hands over the responsibility of the cargo to the truck driver. The truck driver will check the quality and quantity of the cargo before accepting the same.

The cargo is delivered at the end of the chain i.e., the supermarket or retailer. The Zero Damage Exceptions Report of the Discharge Port Terminal is compared with the Zero Damage Control Report at the load port terminal. Performance of the individual partners of the supply chain is measured and feedback given for improvement.

This signifies the end of the Reefer Cargo Supply Chain!

Reference:
www.specialisedreefers.com



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