

REEFERS: A SHIP MANAGERS PERSPECTIVE



AGENDA:

- ❖ What is a reefer container?
- ❖ Sequence : farms and oceans – ships – supermarkets
- ❖ Reefer onboard- initial requirements
- ❖ What does the vessel need to do to ensure safe carriage?
- ❖ What are the common challenges?
- ❖ What steps are taken to mitigate the known risks?
- ❖ Safety



WHAT IS A REEFER CONTAINER?



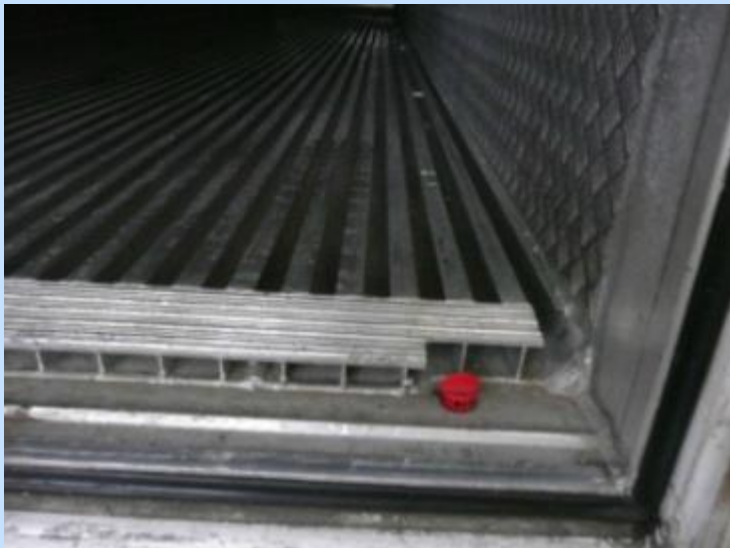
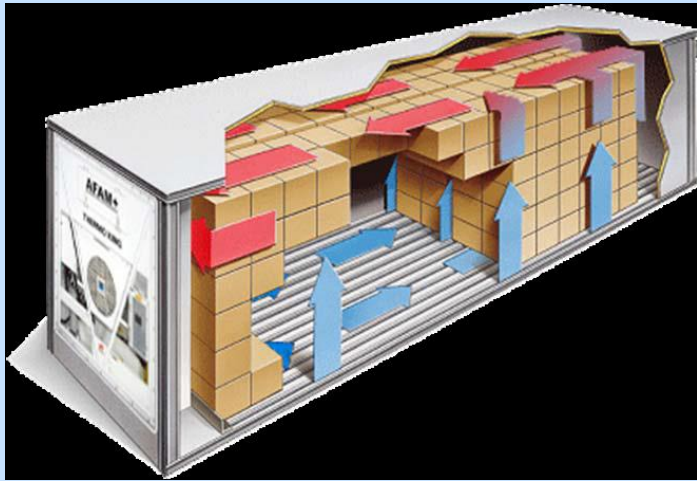
A refrigerated container is a shipping container used in intermodal freight transport that is refrigerated for the transportation of temperature sensitive cargo. Reefer containers usually have their own refrigeration unit, with an air or water cooled heat exchanger. They have their own data logger to record temperature.

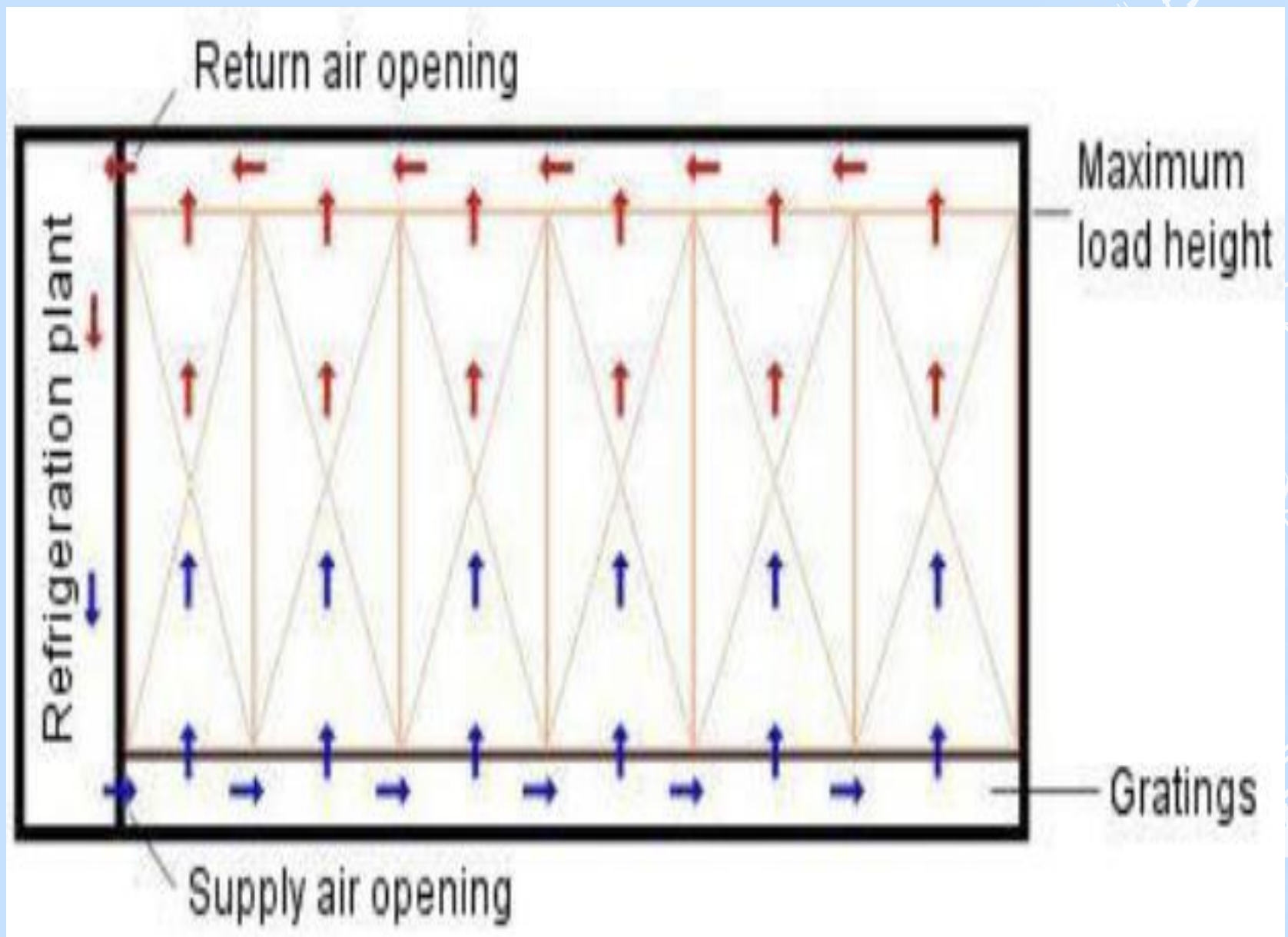
A reefer does have its own inbuilt refrigeration unit but has to depend on external power from the electrical points when on the quay or a container ship

Some reefers are equipped with a water cooling system, which can be used if the reefer is stored below deck on a vessel without adequate ventilation to remove the heat generated.

Water cooling systems are expensive, so modern vessels rely more on ventilation to remove heat from cargo holds, and the use of water cooling systems is declining.

Additional "support" equipment : Ventilation fans , cooling pumps, piping , hoses



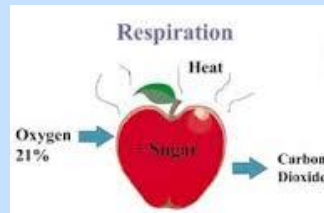


In general, refrigerated commodities may be divided into two distinct categories;

- a) Chilled**
- b) Frozen**



Many chilled cargoes (e.g. fruit) are regarded as a "Live" cargo since they continue to respire post harvest and as such are susceptible to desiccation (wilting and shriveling).

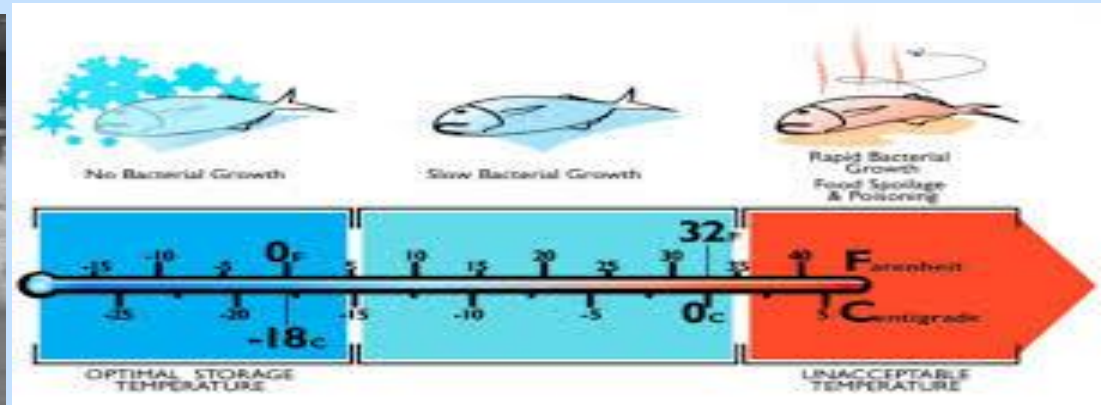


This is not the case with commodities such as chilled meat or cheese.

We choose to refrigerate commodities such as fruits and vegetables because we want to prolong their "practical shelf life" – the time from harvest until the product loses its commercial value

The minimum fruit carriage temperature is usually no lower than -1.1 degree C (30degreeF).

Frozen cargo is regarded as "inert" and is normally carried at or below -18 degree C (0 degree F).



However, both categories are highly perishable and require care in handling to ensure arrival in optimum condition.

Reefer containers are built to maintain temperatures, not to lower them, and these cargoes should therefore be pre-cooled to the optimal carrying temperature.

The Master should not, however, accept carriage instructions that the vessel will not be able to comply with



REEFER UNIT VOYAGE CYCLE



Reefer Container onboard...what should we do?



Reefer containers require special care after they are loaded on board.

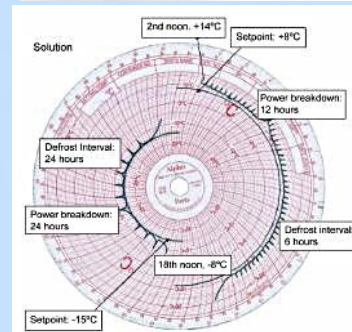
1. Need to be supplied with power



- ❖ Reefer containers shall be plugged in and supplied with ships power as soon as practicable after loading - Ship staff or shore staff? Must be checked by Ship staff in any case
- ❖ Where applicable, cooling water shall be connected and valves opened. This is usually in case of water cooled reefer container units loaded under deck.
- ❖ Reefer remote monitoring cables shall also be connected whenever equipped and compatible.

2. Monitored closely for proper function

- Set temperature compare with manifest temperature
- Present actual temperature on Partlow chart and digital indicator
- Ventilator percentage open or closed, compare with manifest
- Container seal record seal number (e.g.: JJJ 345821 etc)
- Any alarms displayed on the digital indicator
- Control box door firmly tightened to prevent any water damage
- Any abnormal noise or vibration from the refrigerating equipment



3. Repaired as required in case of malfunction.

In case of a malfunctioning unit, the local agent must be informed and reefer technician arranged for inspection and repair. If the unit cannot be satisfactorily repaired within the duration of port stay, it must be off loaded

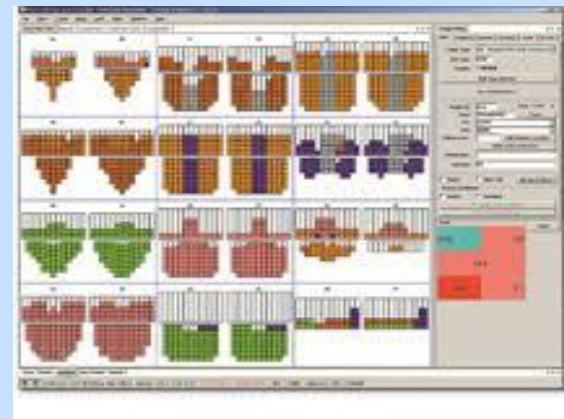


Temperature and alarm monitoring equipment

Reefer container monitoring systems are widely used on board as a centralized station for having an overview of the reefers onboard. This enables an operator to automatically monitor and control hundreds of reefer containers through a single computer system and provides following functions:

- Monitors alarm and temperature conditions, and notifies the user of any alarms generated by the container controller.
- Registers the history of each container, recording all important parameters and storing the data in accurate, detailed log files.
- Interfaces with the vessel's load calculator for automatically transferring reefer container data and locations.
- Optionally send commands, such as "defrost" and "change of set point", to the containers directly from the central system on board.

Failure of the monitoring equipment, would directly lead to increased workload on the ships crew with a risk of human error being more pronounced.



Set sail for next port!

- ***Spare parts and manuals for reefer containers shall be maintained on board as required***
- ***All reefer containers shall be monitored by checking physically at least twice daily (weather permitting).***
- ***Data for each reefer container on board shall be entered in a reefer monitoring log. The reefer remote monitoring system where fitted and operational shall be used whenever possible. Alarms generated on this system shall be attended to promptly and condition of the concerned reefer container confirmed***
- ***In case of a reefer container malfunction, the facts must be reported without delay to concerned parties***
- ***Repair work on the malfunctioning reefer container must be undertaken with best efforts after consulting manuals/drawings and instructions from concerned lines technical department. It is an obligation upon the carrier (and ships crew) to exercise due diligence in preventing any cargo damage.***
- ***Subsequent technical reports shall be sent to concerned parties in line with voyage instructions, until the reefer container is repaired or discharged at the next port.***

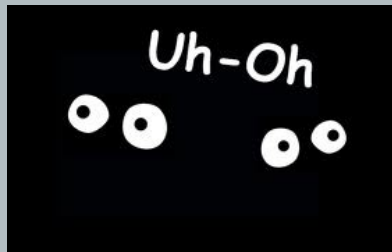


Incorrect shipment: what are the possible reasons?



- Containers off power and therefore off refrigeration for extended times
- Wrong settings caused by incorrect information
- Failure to monitor properly and correct faults or wrong settings
- Poorly pre-cooled or overcooled cargo
- Cargoes with insufficient PSL (practical shelf life)
- Badly stowed containers impeding air flow –many with low quality packaging
- Excess fresh air ventilation for live cargoes thereby causing evaporators to ice up
- Incorrect defrost interval where this has to be set manually
- Incorrectly booked cargo leading to operational and commercial problems





Required power interrupted

- The power supply used must be either 380 volts/50 Hz or 440volts/60Hz.
- The power cables used are fitted with ISO standard CEE-17 plugs
- One of the most common causes of power interruption to refrigerated containers is due to malfunction of one or more of the ships diesel generators.
- If any one of the generators is out of order, the remaining generators shall supply at least seagoing conditions and all certified refrigerated container sockets including cargo hold fans
- Inefficient or poorly maintained generators are not capable of taking full rated load
- Direct impact on power management onboard the vessel.
- Direct commercial impact

Mitigating actions:



- Ensuring crew competence
- 24x7 shore technical support
- Sufficient stock of spares and consumables onboard for maintenance, both routine and breakdown (based on historical trends).
- Following makers recommended overhaul intervals strictly, thereby improving reliability and efficiency.
- Proper planning and execution of maintenance, normally carried out on light legs.
- Risk assessment and management.





Failure of other components in the power supply chain, like cables, transformers, circuit breakers, and even switchboards interrupt continuous power supply to the reefers onboard.



Preventive actions:

- **All vessels are built to classification society requirements but the choice of equipment at the new building stage can have a telling impact through the life of a ship. Hence choose wisely!**
- **Utilization of high quality hardware : approved and rated for the intended use**
- **Sufficient replacement material onboard**
- **Proper care of standby equipment**
- **Planned maintenance to be carried out to avoid surprises**
- **Trained personnel onboard to carry out necessary repairs**
- **Supplementing ships crew with highly skilled shore personnel if required.**



Some of the other reasons that can cause power interruption to the refrigerated containers are

- **Failure of reefer socket receptacle or terminal board.**
- **Drop in Voltage**
- **Reefer not plugged in (yes it happens!)**

A number of reefer extension leads should be carried as a precaution against the failure of individual plugs

Good shipboard maintenance and house keeping practices,

Thorough vessel inspections by attending technical superintendents.

Well trained and competent crew that carry out careful checks during loading /unloading operations



Other factors - direct impact on optimal reefer performance and shipment

- Failure of cargo hold ventilation fans
- Failure of cooling water pumps and /or hoses
- Air ducting and air distribution
- Access for monitoring and repairs
- Failure of alarm monitoring
- Running out of refrigerant
- Reefer loading lists given to a ship by the terminal aren't checked against the bay plans to make sure the container is in its correct position, or at the correct temperature. It's very easy, in this situation, for the crew not to notice the problem.
- Many reefer containers losses have arisen from confusion between Fahrenheit and Celsius temperature scales and also between plus and minus temperatures

° F ° C



SAFETY

- Short port stays and quick turn around
- Safety arrangements are in some ports poor and the work frequently has to be performed in the dark, under windy and rainy or sometimes icy conditions.
- Increased risk of electrocution
- Increased chances of "slips and trips"
- Exposure to refrigerants
- Working in areas with limited access areas
- Increase fire hazard
- Exposure to High-voltage systems



Thank
You



Refrigerated claims handling

M Jagannath
NAU Pte Ltd



Presentation

- ▶ 5 Parts
- ▶ Modes of Reefer Cargo
- ▶ Common Claims
- ▶ Claims Handling Process
- ▶ Policy & Insured's Liability
- ▶ Resolutions strategies



1

Modes of reefer cargo

▶ **Chill Mode**

- Chill mode is used from -5°C and up
- Foodstuffs such as fruit and vegetables
- The temperature of the supply air must be controlled
- Continuous operation

▶ **Freeze Mode**

- Freeze mode is used below -5°C
- Frozen foodstuffs, less sensitive to small temperature variations
- The temperature of the return air is controlled
- Continuous operation or on/off operation.

2

Reefer Cargo Claims

▶ Common Claims

➤ Miscommunication

- 0⁰ Centigrade & 0⁰ deg Farenheight
- -0.5⁰ Centigrade – manifest unable to accept decimals
- Non Operating Reefer

➤ Failure of power during the voyage

➤ Failure of reefer machinery



1

Reefer Cargo Claims

▶ **Normal risks:**

- ▶ These risks are also present for other cargoes.
- ▶ Eg loss/damage due to collision, fire, general average, etc

▶ **Specific risks:**

- ▶ Associated with refrigerated cargo / container
- ▶ More in relation to failure of equipment to perform
- ▶ Or to set the equipment adequately to perform!



3

Claims Handling Building Blocks

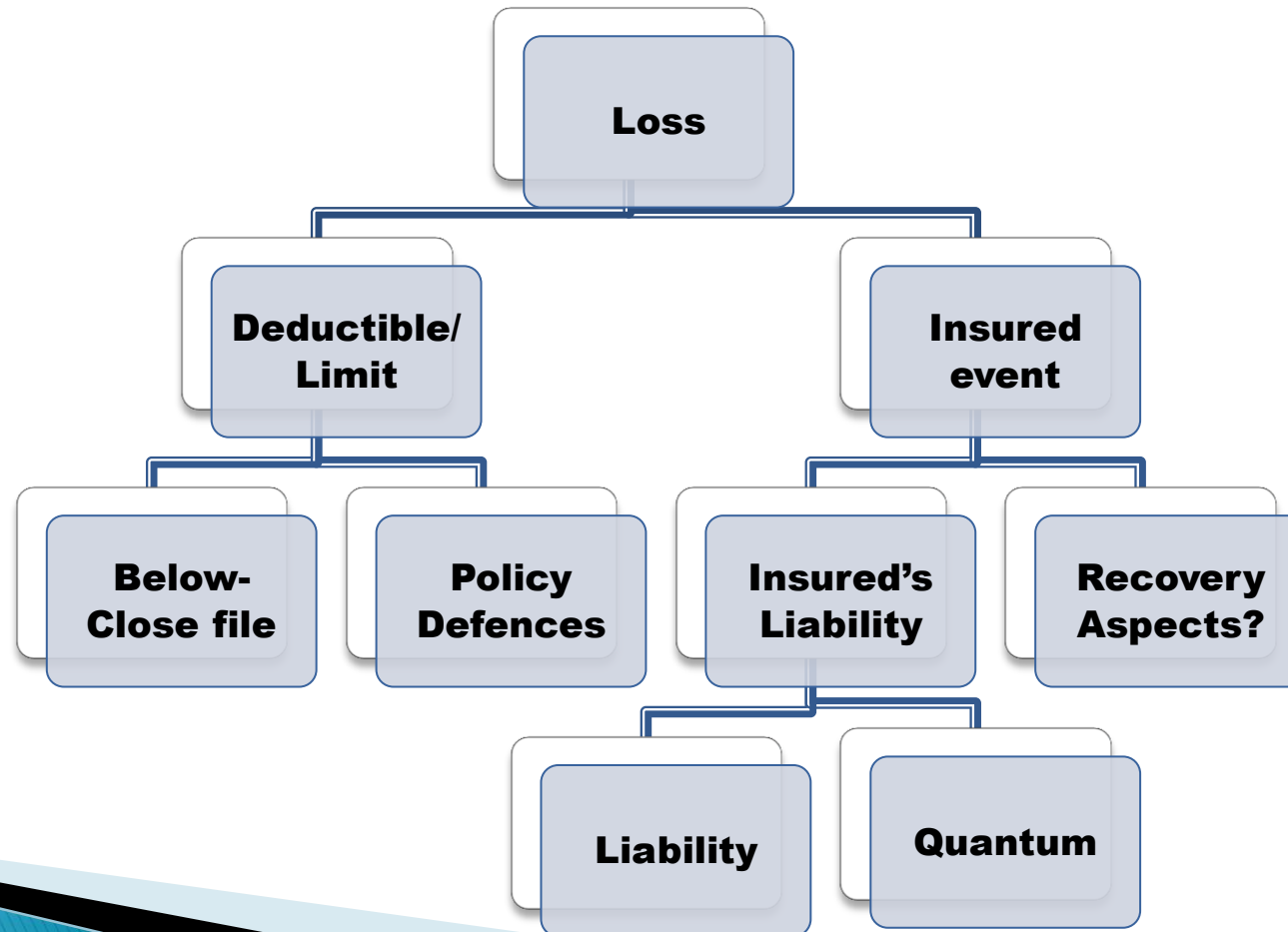
- Statue Law – If English Law – Marine Insurance Act of 1906
- Case Law / Common Law (precedence)
- Contract wordings i.e. policy wordings
- Rules of Practice if application (eg Average Adjusters ROP)
- Recognized Practices in the market
- Commercial Relationship



3

Claims Handling

- Steps are not either sequential or parallel but a combination of both



4

Claims Handling - Liability

- ▶ Derivative
- ▶ Insured must be liable and the loss must be covered under the policy



4

Policy Liability

- ▶ Policy engages if loss is above the deductible
- ▶ Generally large deductibles/ co-sharing of losses
- ▶ Policy liability – upto limit aoioo/aggregate



4

Policy Liability

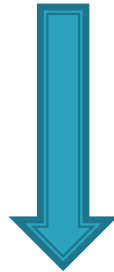
- Is the Loss covered under the Insurance policy?
 - Loss occurred outside the coverage of the policy period
 - Defences available - Exclusions, Conditions & Warranties
 - General defences available under law
 - ✓ Eg: Breach of Utmost Good Faith (S 17 of the MIA 1906)
 - ✓ Duty of Disclosure (S18 of the MIA 1906)
 - ✓ Excluded losses provided under S55(2) of the MIA 1906 ...willful misconduct
- We are not touching on this aspect as we believe that these situations would generally be rare, far and few in between given that Insurers will be selecting good risks to Insure



4

Insured (Carrier's) Liability

- ▶ Liability – Responsibility
- ▶ Role of the Insured
 - Container operator, Time Charterer, Vessel Owner / Operator
- ▶ Need to know the complete circumstances of the loss
 - Joint survey at the time of loss to determine this
 - Review of relevant information (Partlow chart, Data Logger)



- This will hopefully assist in knowing how the loss occurred



4

Insured (Carrier's) Liability

- ▶ No fault / negligence of the Carrier
- ▶ Instead fault of Cargo Interests
 - Deterioration of cargo due to high loading temperatures
 - Improper stowage of cargo due to which improper air circulation
 - Incorrect temperature requested (0 deg Celsius (Chill temperature) / 0 deg Farenheight Frozen Temperature)
 - REPUDIATE CLAIM!!!!



4

Insured (Carrier's) Liability

- ▶ Loss happened during the responsibility of the Carrier
- Two factors to always consider when there is a claim
 - ▶ Quantum i.e. the \$\$\$ of the claim
 - ▶ Liability
- Mitigation of Loss – can it bring down the quantum?
 - ▶ Mitigation of loss is concerned with the claimant's responsibility to avoid avoidable losses by taking all reasonable steps to do so – a good surveyor acting for liability interests will certainly ensure that this is accomplished on a without prejudice basis!!!!



4

Insured (Carrier's) Liability

- Technical Defences:

- Late notification
- Time bar available either under compulsorily applicable cargo conventions or the contract of carriage
- Jurisdiction

- Legal Defences:

- Role of the Carrier – did he provide the container or was it of the TC/Container Operator
- Title to sue – depending on the application of UK COGSA 1992/ Singapore Bills of Lading Act Cap 384 or application of Bills of Lading Act 1855
- Exclusions of Liability under The Hague / Hague Visby Rules
 - provided in Art IV (2) a – q provided the Carrier fulfills Art IV(1) and which includes Art III (1)



4

Insured (Carrier's) Liability

▶ Art IV (1)

- Neither the carrier nor the ship shall be liable for loss or damage arising or resulting from unseaworthiness unless caused by want of due diligence on the part of the carrier to make the ship seaworthy, and to secure that the ship is properly manned, equipped and supplied, and to make the holds, refrigerating and cool chambers and all other parts of the ship in which goods are carried fit and safe for their reception, carriage and preservation in accordance with the provisions of paragraph 1 of Article III. Whenever loss or damage has resulted from unseaworthiness the burden of proving the exercise of due diligence shall be on the carrier or other person claiming exemption under this article.

▶ Art III (1)

- The carrier shall be bound before and at the beginning of the voyage to exercise due diligence to:
 - (a) make the ship seaworthy
 - (b) properly man, equip and supply the ship;
 - (c) take the holds, refrigerating and cool chambers, and all other parts of the ship in which goods are carried, fit and safe for their reception, carriage and preservation.



4

Insured (Carrier's) Liability

▶ Art IV (2)

- ✓ (m) ... any other loss or damage arising from inherent defect, ...;
 - ✓ (n) insufficiency of packing;
 - ✓ (p) latent defects not discoverable by due diligence;
 - ✓ (q) any other cause arising without the actual fault and privity of the carrier, or without the fault or neglect of the agents or servants of the carrier, but the burden of proof shall be on the person claiming the benefit of this exception to show that neither the actual fault or privity of the carrier nor the fault or neglect of the agents or servants of the carrier contributed to the loss or damage.
- q defence difficult but possible
 - Consider *Leesh River Tea v British India Steam Navigation* [1967] 2 QB, CA & *The Calavan Foods case* (Appeal No. 4649), in the San Francisco Superior Court of Appeals



4

Insured (Carrier's) Liability

- Limitation of Liability

- Art IV (5) a of HV Rules
- SDR 2/kg or SDR 666.67/package – whichever is higher
- Difficult to break except for “...done with intent to cause damage, or recklessly and with knowledge that damage would probably result” (Art IV (5) e)
- Problem – Limitation sometimes may not be of assistance as B/L's may list no of packages resulting in high limitation amounts!

- Time Bar

- Art III (6) of HV Rules provides for claims to be extinguished unless suit brought within one year
- Art III (6 biz) – Indemnity actions may be initiated within the time allowed in the courts seized or not less than 3 months from the date claim settled



4

Insured (Carrier's) Liability

- Quantum

- Proof & Extent of Loss

- Whether any mitigation of loss to reduce the claim

Eg Chill Cargo – even if temperature was not maintained, cargo may be saleable but at a discounted price

Frozen cargo – salability would depend whether the cargo has become deteriorated due to microbiological, chemical, bio-chemical & physical reaction

(Important to know Time Temperature Tolerances of cargoes being carried – this will vary from cargo to cargo)



5

Claim Resolution Strategies

- Direct Claimant to correct contractual party / cargo insurer
 - Advantage – claim will be adjusted and may become time barred by the time it reaches the Insured
- Protect recovery rights – any overlying carrier who may be at fault?
- Jurisdictional Challenges
 - Time involved
 - Costs
 - Whether Justice will be achieved
 - Home advantage to a litigant



5

Claim Resolution Strategies

- Consider settlement
 - Limitation of Liability as available under the Hague Visby Rules (Art IV (5) a – SDR 666.67 per package or SDR 2 per Kg – which ever is higher
 - Limitation of Liability available under the contract
 - Costs of defense (nuisance settlement)

- If Loss sizeable, consider whether Global Limitation Conventions are of assistance?
 - '57 Limitation Convention
 - '76 Limitation Convention
 - 1996 Protocol to the '76 Limitation Convention



5

Claim Resolution Strategies

- Use good negotiators
- Positional vs Interest based negotiation
- Better to let the claims be handled by Insurers i.e. Liability Insurers and Cargo Insurers
- Ensure best practices to avoid similar incidents
- No claims means less headaches and lower premium!
- But Claims do happen and must be dealt expeditiously



THANK YOU



Maritime Knowledge Shipping Session 29

REFRIDGERATED CARGO CLAIMS AND UNDER WRITING THE ROLE OF THE SURVEYOR

And
Case History

Nicolas White M.N.I. M.I.I.M.S.
Director Claims, Disputes, Litigation & Shipping
London Offshore Consultants Pte. Ltd.

DISCLAIMER

This presentation has been prepared and is being delivered in my capacity as an Independent Marine Consultant, and opinions given do not necessarily reflect the views of London Offshore Consultants Group Ltd.

OVERVIEW

- Surveyor or Consultant?
- Refrigerated Cargoes.
- A case history

SURVEYOR OR CONSULTANT?

*In the land of the blind,
a one eyed man
can charge what he likes!*

SURVEYOR OR CONSULTANT?

- There are no formal professional standards for marine surveyors or consultants.
- Most surveyors and consultants come from a seagoing background, either Master Mariners or Chief Engineers, and in many cases, lesser qualifications.
- A surveyor, someone who inspects, measures, assesses and reports.
- A consultant, someone who offers advice or a service based on his knowledge.

SURVEYOR OR CONSULTANT?

- 25 Years ago, the Consultancy I worked for at the time, determined the requirements for employing a Master Mariner or Marine Engineer were persons who had a minimum of 5 years experience in command or as Chief Engineer. It was further determined that it was unlikely such a person would be less than 40 years of age.
- Over the past 40 something years, there has been a huge swing for owners to employ seafarers from lower cost based countries.
- Training of seafarers has become more class room based and fast track. It is not unheard of to find Master or Chief Engineers who have been at sea for less than 10 years.

SURVEYOR OR CONSULTANT?

- In 2000, there was a shortage of 16,000 officers and in 2010, the shortage had increased to 46,000. The current labor market of seafarers has a significant shortage of senior officers that are educated and well trained.
- A recent study has shown that 72% of seafarers will stop sailing before the retire. Just under 25% of them will stop after 1 – 2 years and around 45% between 5 – 10 years.
- What has that to do with the *One eyed man* you might ask.

SURVEYOR OR CONSULTANT?

- Everything – Not just Survey Companies but all marine related shore activities.
- There is a shortage of experienced marine personnel coming ashore.
- This is ultimately affecting the quality and experience of some surveyors, especially those who set up business on their own, or join small companies who do not have the resources to provide additional training.
- Unfortunately, training and updating of surveyors comes at a price, a price that some clients are unwilling to pay.
- However, making the right choice can and does save Underwriters money.

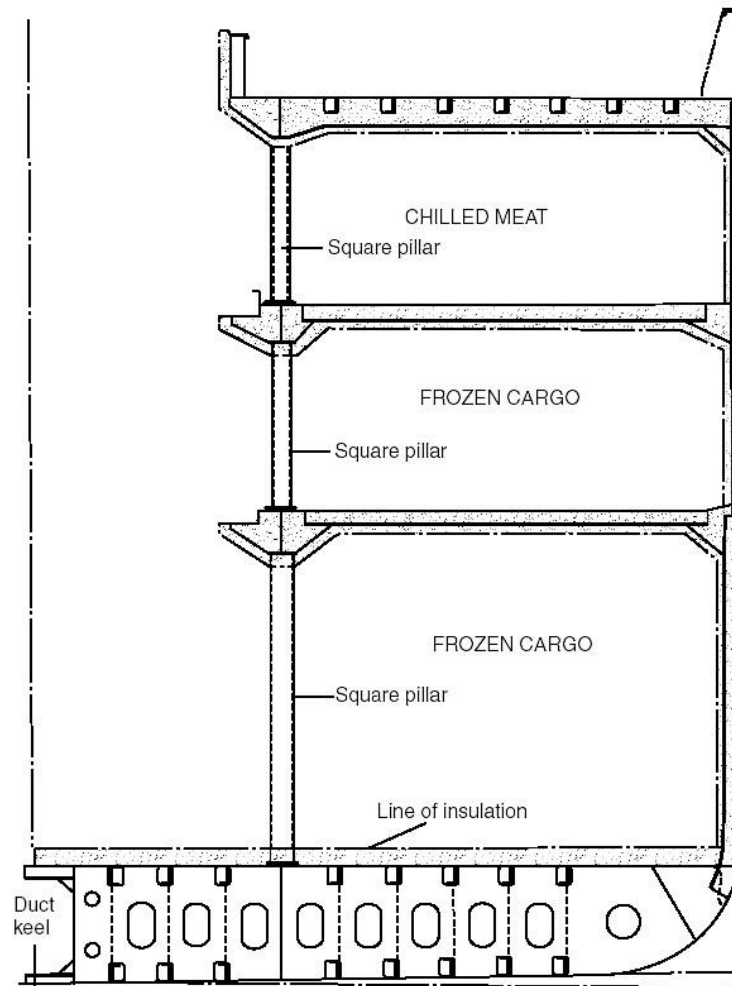
REFRIGERATED CARGOES

- Today refrigerated cargoes move in substantial quantities.
- Specialist vessels wholly dedicated to the carriage of refrigerated cargoes under a variety of temperatures.
- Conventional break bulk cargo may be handled around 15 times from leaving the producer to arriving at the market.
- The introduction of reefer containers has added outstanding value in ensuring good turn-out of cargo under refrigerated conditions.
- The use of reefer containers protects the cold chain from producer to market.
- Notwithstanding, for the foreseeable future refrigerated cargo will continue to be carried in specially designed, pallet efficient, reefer ships.

REFRIGERATED CARGOES



REFRIGERATED CARGOES



REFRIGERATED CARGOES



REFRIGERATED CARGOES

How big is the global reefer trade?

Estimated perishable reefer cargo modal split, 2012

Commodity	Non-container (%)	Container (%)	Non-container (million tonnes)	Container (million tonnes)	Total (million tonnes)
Bananas	53.0%	47.0%	8.38	7.43	15.81
Citrus	47.0%	53.0%	2.61	2.94	5.54
Deciduous	32.0%	68.0%	2.59	5.51	8.1
Exotics	40.0%	60.0%	1.46	2.19	3.65
Fish/seafood	39.0%	61.0%	6.12	9.57	15.69
Meat/poultry	22.0%	78.0%	5.06	17.92	22.98
Dairy	8.0%	92.0%	0.15	1.72	1.87
Other	5.0%	95.0%	0.94	17.83	18.77
Total	29.5%	70.5%	27.31	65.11	92.42

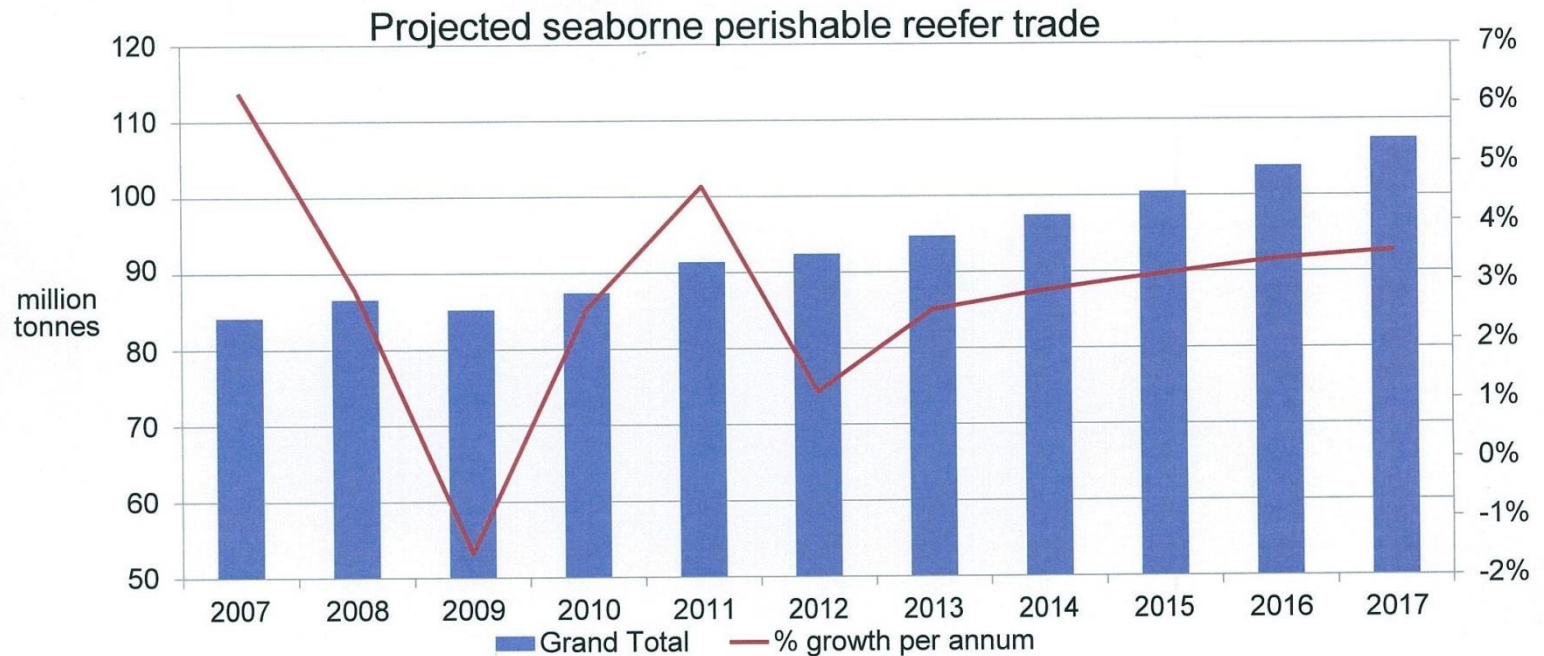
At an average 24 tonnes per 40ft box, this equates to a global cargo pie of **5.4 million teu** (2.7 million feu)

At an average 22 tonnes per 40ft box, this equates to a global cargo pie of **5.92 million teu** (2.96 million feu)

Meat/poultry is the largest commodity group (24.9%), followed by bananas (17.1%) and seafood (17%)

REFRIGERATED CARGOES

Global reefer cargo growth to 2017



REFRIGERATED CARGOES

- Top 10 critical areas of occurrence that lead to cargo claims arising from reefer cargoes:
 - Containers off power and therefore off refrigeration for extended times;
 - Wrong settings caused by incorrect information;
 - Failure to monitor properly and correct faults or wrong settings;
 - Poorly pre-cooled or overcooled cargo;
 - Cargoes with insufficient practical storage life;

REFRIGERATED CARGOES

- Top 10 critical areas of occurrence that lead to cargo claims arising from reefer cargoes:
 - Badly stowed containers impeding air flow – many with low quality packaging;
 - Excess fresh air ventilation for “live” cargoes thereby causing evaporators to ice up;
 - Incorrect booked cargo leading to operational and commercial problems;
 - Fahrenheit or Celsius temperatures interchanged or wrongly converted.

REFRIGERATED CARGOES

- So who best to deal with such problems and investigate the cause?
- Most certainly someone with experience of reefer containers, a Reefer Engineer or Marine Engineer.
- A Master Mariner? – Could be a case of a *One eyed man*, depending on his qualifications and experience.

REFRIGERATED CARGOES

- What about the cargo inside the reefer container?
- The cargo could be:
 - Well just take a look around the Cold Storage at the fresh fruit and vegetables, dairy products, frozen meat, fish and vegetables, chilled meat and fish - an endless list of commodities all requiring different storage temperatures and conditions. Most of these items will have been transported in reefer ships or reefer containers.
 - It should also be remembered that many pharmaceutical products are also carried in reefer containers.
 - So who is best to determine what can be done with the cargo to minimise Underwriters' exposure?

A CASE STUDY

CEPHALOPODS!!

- Hands up who knows anything about Cephalopods (Don't say anything if you do).
- Hands up who knows what a Cephalopod is? (Again don't say anything if you do).

A CASE STUDY

- Much the same questions were put to 10 different surveyors who were appointed on behalf of 10 different cargo consignees one evening in Malaysia.
- One or two of the surveyors had “Captain” on their card, one or two “Engineer Surveyor” and others simply “Surveyor” or “Managing Director” etc.

A CASE STUDY

- I will give you a couple more clues.
- Chumi Chumi?
- Sotong?

A CASE STUDY

- Yes – We are looking at the humble squid.



A CASE STUDY



A CASE HISTORY

“MAUNAKEA”

And

The 5,303.476MT Of

CEPHALOPODS!!

A CASE HISTORY

- “MAUNAKEA” a 6,392 deadweight refrigerated cargo vessel.
- Vessel had 4 cargo holds each having two insulated compartments, the lower compartment having two decks.
- Loaded with 296,859 blocks (5,303.476 MT) of frozen squid.
- Cargo spaces cooled down, and temperatures maintained by means of a screw compressor and chilled air circulation system. Each cargo compartment provided with two sets of air coolers with the chilled air distributed from floor ducts and re-circulated.

A CASE HISTORY

- Loaded with 296,859 blocks (5,303.476 MT) of frozen squid.
- Value of the cargo approximately USD 8 million
- The 5,303.476 MT of cargo represented 1/6th of the annual import of squid into Korea.

A CASE HISTORY



A CASE HISTORY

- “MAUNAKEA” departed Berkeley Sound, Falkland Islands, South Atlantic, on 3 April, 2006 bound for Pusan, South Korea.
- On the 29 April, at about 08:30, main engine turbo charger disintegrated, which led to a fire in the upper engine room, eventually spreading to the accommodation and after part of No. 4 cargo hold.
- Crew abandoned the vessel.
- Vessel’s position about 420 nautical miles South West of Bandar Aceh.

A CASE HISTORY



A CASE STUDY

- First tug arrived on scene on the 2 May at about 02:00, by this time the fire in the accommodation had burnt itself out, but smoke still emanating from No. 4 cargo hold.
- Salvage team and additional salvage tug arrived at casualty on afternoon of 3 May and connected a portable generator to the cargo hold ventilation system.
- 5 May, a quantity of dry ice had been transferred to the casualty and placed in way of the cargo hold air circulation fans.
- 6 May, casualty arrived off Penang to await arrival of a chartered reefer vessel for a ship to ship transfer of cargo.
- 7 May, cargo barge alongside with a tank of CO₂ which was pumped into No. 4 cargo hold to extinguish the fire still smouldering.

A CASE STUDY



A CASE STUDY

- Chartered reefer vessel refused to accept cargo, because it was distressed.
- 8 May casualty taken to Port Klang anchorage.
- There then ensued many meetings to get permission to bring the vessel into port and to decide on the fate of the cargo.
- Attempts were made to secure storage in the various cold store facilities, but word had spread that the cargo had been without refrigeration for two weeks, and the facilities declined to accept the cargo.
- A contractor was engaged to rebuild and commission the vessels reefer compressors, and liquid nitrogen was injected into the cargo holds.

A CASE STUDY



A CASE STUDY

- All this time neither consignees or their underwriters showed any interest in the cargo.
- Salvors and Owner's P&I Club, appointed two food scientists who specialised in seafood products.
- Time to think out of the box!
- While talks continued with the cold storage facilities, now with the food scientists engaged, we also looked at:

A CASE STUDY



A CASE STUDY

- Hiring the ice skating rink at Sunway Lagoon, tenting in the area and using specialised stand alone chiller units.
- Luckily this option was not needed as the food scientists managed to persuade one cold storage facility that the cargo was sound, word spread and we managed to find sufficient space in cold storage facilities to accommodate the contents of 3 of the 4 cargo holds. Comprising a total of 218,676 blocks.
- Unfortunately, much of the cargo in hold No. 4 had been tainted by smoke from what had been a fire in the insulation. This comprised 77,659 blocks, all of which were discharged into 58 x 40ft freezer units.

A CASE STUDY



A CASE STUDY

- So what happened?
- The 10 surveyors acting on behalf of 10 of the 14 Consignee's showed little interest, other than all insisting to be able to take their own core temperatures of each block. The P&I Club agreed on a joint approach to minimise the time needed transferring the cargo between hold to freezer truck. Attending surveyors were told would have to accept this methodology for the benefit of the cargo.
- Consignees rejected the cargo based on the core temperatures recorded.
- Salvors managed to keep the cargo temperatures to below -12°C (I am informed that this is the temperature at which microbes can start to live).

A CASE STUDY

- It took 44 days, from the day of the fire until the last of the cargo was returned into cold storage to a temperature of -25°C.
- From the packaging, it was noted that the squid had a storage life of 24 months.
- From daily records maintained, and from data used by the two independent food scientists, it was demonstrated that the squid from hold Nos. 1, 2 and 3, was still fit for human consumption and that the storage life had only been reduced by about two weeks.
- Armed with this information, the cargo from hold Nos. 1, 2 and 3 was sold on the local market at the then current market price.

A CASE STUDY

- A buyer was eventually found for the tainted squid from No. 4 hold, at something like 40% of the market value.
- Without a doubt, the advice given, and records kept by the two independent food scientists, helped reduce what would otherwise have been a significant claim.

Moral of the Story?

In the land of the blind
make sure you find a man with

Two Eyes

Thank You!