



Carefully to Carry

Refrigerated containers

The international transport of temperature controlled raw materials and final products is an essential link in many industries between producers and consumers. Most cargoes have properties that will determine practical storage lives (PSLs), which are a key factor if they can be carried by sea.

A container operator observes evolving patterns of trade. Examples are:

- More countries exporting by sea – especially fruit, fish, flower bulbs and meat (see also 'Meat and meat products in containers' in Section 5).
- Some shorter life products spending more than half their PSL in transit.
- Demands from supermarkets for all-year-round supplies reducing seasonality.
- Lower stock holding with demands for just in time deliveries and inventory control.
- Some moves from airfreight – particularly cargoes needing due diligence records such as pharmaceuticals.
- Use of intermodal movements depending on local requirements and facilities.

A prudent carrier has to apply a systematic approach to ensure that the equipment and service provided is 'fit for the purpose intended'. To achieve the requirements needs:

- Containers of appropriate design that are maintained correctly.
- A process (temperature controlled chain) that is capable of remaining in control.
- A set of detailed procedures.
- A reliable information system.
- Trained staff.
- Shippers that correctly stuff containers with properly prepared cargoes to meet their customers' purchase specifications.

Claims and incidents

The vast majority of cargoes outturn well and claims represent a fraction of 1% of the containers carried. Temperature controlled container carriage is developing and there are many things that can, and very occasionally do go wrong. The video issued by the Club, If you think any fool can stuff a container – think again, provides a graphic demonstration of how not to get cargo to its destination in good condition.

Experience is a great teacher and even the best-designed systems can be found wanting with 'Murphy's law' and human error ever present. An individual temperature controlled container may suddenly appear to have attracted multiple errors and faults while the many others carried in the same transit having perfect outturns. Cambridge Refrigeration Technology (CRT) runs a training



"The carrier shall properly and carefully load, handle, stow, carry, keep, care for and discharge the goods carried."

Hague Rules,
Articles iii, Rule 2

Carefully to Carry Advisory Committee

This report was produced by the Carefully to Carry Committee – the UK P&I Club's advisory committee on cargo matters. The aim of the Carefully to Carry Committee is to reduce claims through contemporaneous advice to the Club's Members through the most efficient means available.

The committee was established in 1961 and has produced many articles on cargoes that cause claims and other cargo related issues such as hold washing, cargo securing, and ventilation.

The quality of advice given has established Carefully to Carry as a key source of guidance for shipowners and ships' officers. In addition, the articles have frequently been the source of expertise in negotiations over the settlement of claims and have also been relied on in court hearings.

In 2002 all articles were revised and published in book form as well as on disk. All articles are also available to Members on the Club website. Visit the Carefully to Carry section in the Loss Prevention area of the Club website www.ukpandi.com for more information, or contact the Loss Prevention Department.

course that uses a real claim as a short case study. Six individual separate faults, and errors, occurred. The cargo had a value of US\$750,000 and unbelievably it was not a total write off!

The following list is not exhaustive but covers a typical list of ten critical areas of occurrence reported to a typical cargo claims, or cargo care, department that may result in a confirmed claim:

- 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.
- 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.
- Fahrenheit and Celsius temperatures interchanged or wrongly converted.

This list is not in priority order with claims relative to the number of containers carried very low.

There is a long list of minor but important issues that relate to individual incidents. They can include physical damage, broken security seals, air probe temperature sensor failures, and partial or complete loss of refrigerant, generator failure during land transit and many more.

Patterns of claims and incidents

Because of the small number of claims the statistics are difficult to analyse. It is sometimes possible to observe patterns of claims/incidents by careful systematic review of all the factors. For example – the surprising patterns that continue to involve alleged temperature abuse of frozen fishery products. Additional points to check include:

- New export locations.
- Pre-shipment temperatures and the use of 'glaze (water)' to protect the product.
- Freezing of items individually (IQF) rather than as a block. (A less dense more temperature-sensitive cargo with a lower heat sink in the container).
- Low stuffing and unstuffing times to avoid temperature rises.
- The temperature set point. (The popular -18°C needs to be colder and -23°C is acceptable for most containers with many able to be set colder).

A difficult area involves a few subrogated claimants that are unwilling to accept that Lines do not guarantee cargo temperatures. The set point is the temperature of the air passing a sensing probe and is not the temperature of the cargo. Cost and time would be saved if these professional claimants attended an independent training course to understand how a modern integral unit operates.

Fortunately most temperature controlled containers built since 1994 contain data loggers that record a variety of information. They are like a simple aircraft 'black box'. Independent loggers are also available so that a wide variety of audits and checks can be made. When reviewing a claim/incident a download can show:

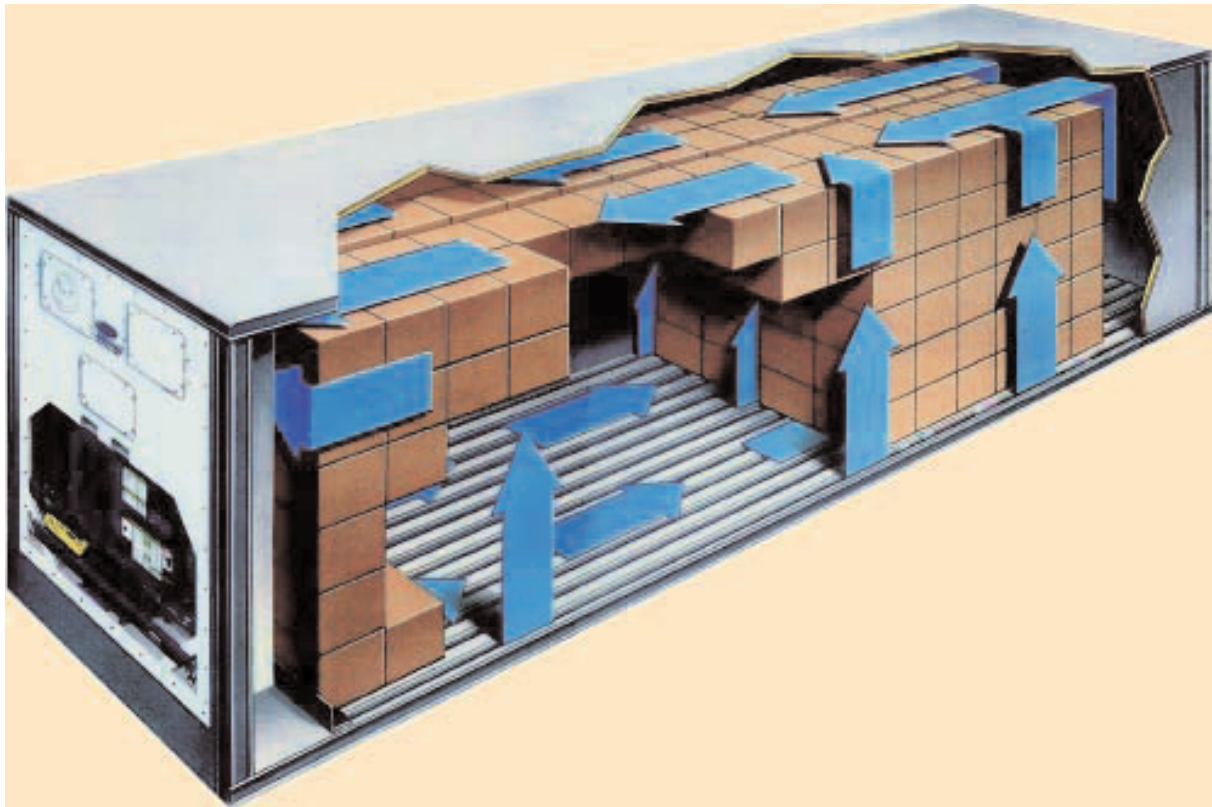
- Pre-trip inspection records.
- Set point plus supply and return air temperatures at preset intervals.
- Defrosts.
- Times off-power.
- Basic faults.
- Relative humidity.

This is a major step improvement from just recorder chart details. It will be some years before containers without digital electronics are replaced. This factor is delaying the full introduction of remote monitoring on vessels and terminals although most new vessels are so equipped. As always the data remains the property of the container operator.

Ways forward

The future trends are mainly positive and a selection follows:

- Integral containers:
 - More reliable with improved airflow, calibrated air freshening vents, dehumidifiers, and other programmable settings.
 - Improved insulation with lower degradation over time.
- New vessels providing faster transits, new routes, and some relaxation in inland road weights.
- Leading consignees and shippers working with lines to provide good logistics.
- Increasing uniformity of regulations between groups of countries reducing variations.
- Foods standards agencies or equivalent developing in key countries.
- EU/UN inspectors approving meat and fishery product facilities thereby improving standards.
- US Food & Drug Administration moves from inspection to prevention mode.
- Acceptance of hazard analysis by big food companies and many countries as a safety measure. In the meantime information and training continue as active methods of preventing claims. Examples are:
 - The Internet (and Intranet in many companies) provide a systematic method of communication.



- P&O Nedlloyd has put its Temperature Controlled Cargo Guide onto its website.
- A booklet by the University of California provides good information on stowing containers plus very good photographs on troubleshooting some perishable product problems.
- Modern videos such as If you think any fool can stuff a container – think again.
- Training courses run by integral container refrigeration equipment manufacturers and organisations such as Cambridge Refrigeration Technology.
- Support of organisations such as International Cold Chain Technology.

The International Quality Standard ISO9000:2000 requires changes in approach if companies wish to retain, or obtain, assessment. It requires:

- Customer focus.
- Leadership.
- Involvement of people.
- Process approach.
- System approach to management.
- Continual improvement.
- Factual approach to decision making.
- Mutually beneficial supplier relationships.

Conclusions

The carriage of temperature controlled cargoes in containers is growing with the vast majority of outturns meeting both the shippers' and consignees' requirements. Advances in digital electronics are improving the ability to manage transits.

A systematic approach to analysing the causes of claims and incidents can lead to effective remedial and preventive actions.