

NAUTICAL NOTES

NOTE No 5

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TRANSPORTATION OF PERISHABLE CARGOES

INTRODUCTION

The carriers of perishable cargoes, be they Conventional or Through Container Operators, are facing a challenging time. The changes are coming on two Fronts - Legislative and Technical.

This Nautical Note looks to act as a starting point for consideration of some of those areas which Carriers may need to consider faced with these challenges. The term 'perishable cargo' means any product which may require temperature control, atmosphere control and/or ambient ventilation carriage.

LEGISLATION BACKGROUND

The Single Market developments within the EEC is bringing a common framework of regulations to its Member States. The EFTA countries and some of the former Eastern Block countries are keen to accept the EEC standards. The USA remains outside these arrangements and since 1980 has evolved piecemeal legislation, some at Federal, but much at State level.



EEC LEGISLATION

During the past few years there has been a quickening in the pace of the introduction of temperature control and hygiene legislation affecting the carriage of perishable cargoes. Even though some of the new legislation has been under consideration for some time there continues to be much confusion regarding interpretation and implementation. This is not helped by the fact that even though primary legislation has been enacted; secondary legislation, guidelines and codes of practice are still being drafted.

The uncertainty which surrounds the new legislation makes it very difficult to know exactly what a carrier has to do to keep within the law.

While the legislation regarding temperature control requirements are fairly clear, it is the hygiene and food safety requirements which are going to be of most concern.

TEMPERATURE CONTROL LEGISLATION

2.3.1 With the approach of the European Single Market a number of EC Directives have been issued regarding temperature requirements for specific categories of food; and which include the following:

- Quick Frozen Foods (Dir. 89/108/EEC)
- Fish and Fish Products (Dir. 91/493/EEC)
- Red Meat Directive (Dir. 91/498/EEC)

The temperature control requirements are for product temperature and not air temperature.

A summary of United Kingdom legislation and EC Directives covering legislation controlling temperature has been compiled by the Ministry of Agriculture, Fisheries and Food, and the latest edition dated November 1991 is attached as Appendix 1.

2.3.2. An EC Directive has also been issued covering the sampling and monitoring of temperatures of Quick Frozen Foodstuffs. This requires that the means of transport must be fitted with suitable recording instruments - approved by the competent authorities of the country in which the means of transport are registered - to monitor during their operation at frequent and regular intervals, the air temperature to which QFF's intended for human consumption are subjected.

Temperature recordings will have to be dated and stored for one year by the carrier

2.3.3. A fuller summary of the above and other legislation is available on request.

FOOD SAFETY HYGIENE LEGISLATION

2.4.1 The responsibilities being placed on carriers under the United Kingdom's Food Safety Act 1990 and the proposed EC Directive on the Hygiene of Foodstuffs, are ones which are of major concern.

Food Hygiene means all measures necessary to ensure the safety, soundness and wholesomeness of food at all stages from its production, processing, manufacturing, packaging, storing, transportation, distribution, and handling of sale to the final consumer.

In the event an offence has been committed it may be necessary for a carrier to prove that all reasonable precautions have been taken and due diligence exercised to prevent the commission of the offence.

Guidelines which have been issued on the statutory defence of 'Due Diligence' would suggest that, if necessary, carriers need to be in a position to prove on the balance of probabilities that they have taken all reasonable precautions and exercised all due diligence. This will require having available written records showing systems and methods of control. An important part of any defence requires being able to show clearly defined the responsibilities of staff and important instructions to them in writing.

2.4.2 It is no longer sufficient just carrying out one's responsibilities in a professional manner, carriers must now be able to prove they are diligent. The need to monitor and record temperatures may be as follows:-

- To comply with new legislation
- To comply with codes of practice
- To meet customers requirements (they will be wanting to protect themselves)
- To prove due diligence if there has been an offence somewhere in the cold chain.

2.4.3. Importers will no longer be able to rely solely on warranties provided by someone beyond the jurisdiction of the courts.

Under the new Food and Nutrition Act in the USA a responsible person can be prosecuted even if he did not know that an offence had occurred.

CONCLUSIONS

There are a number of Key questions which both Conventional reefer and Through Container Operators should be asking themselves. These include the following:

- Do we know where we stand with regard to the new Food Legislation?
- Have we undertaken an assessment of the hazards in carrying Food Cargoes and do we have a structured programme
- to eliminate or control their risks? (HACCP _ Hazard Analysis and Critical Control Points is recognised as a systematic and preventive food safety approach)

- Do we have an incident procedure with someone nominated as responsible for handling incidents?
- Do we have a system to analyse claims to provide feedback for areas that require corrective action so that the negative parts of 'Due Diligence' can be seen to be carried out?
- Are the officers and crews on the vessels carrying the cargoes aware of the new Food Legislation and their responsibilities?

TECHNICAL INNOVATIONS BACKGROUND

The intensive research over the last few years into Controlled Atmosphere systems means that the deepsea transportation of perishable goods trade is poised to transform both the quality and range of its existing service. It is now possible to source produce from areas previously considered as beyond those accessible for standard refrigerated transportation.

MODIFIED ATMOSPHERE SYSTEMS

The long-established modified atmosphere (MA) practice of creating an environment within a Freight container, at the outset of transportation as a once only treatment, is becoming more refined. Instead of making the Freight container the MA unit, shippers are now looking to make the Fruit itself or it's packaging into the MA unit. Developments in this field include the following:

EVERFRESH

Everfresh is a mineral impregnated polyethylene film which absorbs the ethylene gas given off by fruit, which normally speeds the ripening process.

The permeability of the film allows for the discharge of other gases i.e. Carbon Dioxide. Also, the addition of an anti-fogging treatment to the film reduces the formation of water drops and the potential for mould and bacterial growth.

CARBOXYLMETY L CHITOSAN

Though not yet available for commercial use it has been reported that scientists have developed this fruit coating which is claimed can extend the shelf life of apples, pears and oranges by six months.

It is based on chitsin, found in the shells of crabs, lobsters and prawns, and is the most common polymer after cellulose.

The coating is water soluble, biodegradable and dries into a permeable non-toxic film. It supposedly works by attacking bacteria attracted to fruit.

SEMPERFRESH

Semperfresh is a range of fruit coatings that are based on sucrose esters. The coating dries on the fruit to produce a membrane that is differentially permeable to gases. It essentially creates a modified atmosphere inside the treated produce by reducing the amount of oxygen taken in while permitting most of the carbon dioxide to escape into the atmosphere. Permeability varies with different thicknesses of coating and different varieties of fruit.

Trials carried out on commercial shipments would suggest some benefit can be gained from this treatment though it still requires the produce to be carried under temperature control.

WESTERN AUSTRALIAN MEAT MARKETING CORP (WAMMC) IN - HOUSE SYSTEM

Developments in MA systems have not only been restricted to the carriage of fruit and vegetable products.

The WAMMC MA method for consignments of chilled lamb is relatively simple, and involves the sealing of two lamb carcasses in a nylon bag. All oxygen is evacuated and replaced by carbon dioxide. When transported in this way, WAMMC reports that the product shelf life is extended to 12 weeks.

CONTROLLED ATMOSPHERE SYSTEMS

While CA containers have been around for several years, most have relied on a passive system whereby the cargo has had to generate its own atmosphere. An alternative was the use of bottled or liquid nitrogen and carbon dioxide, though this method tended to be bulky, heavy and have limited endurance. However, several manufacturers are now offering or currently developing active systems where nitrogen is generated from air by the use of permeable membranes. Levels of carbon dioxide, oxygen, ethylene and relative humidity are independently monitored and adjusted by sophisticated controllers.

Unfortunately, current information is limited as the manufacturers consider their developments, so far as commercially sensitive. Little operational experience is known but successful trials have been completed, including Blueberries from Australia to North Europe (38 days) and Flowers from Rotterdam to Miami (13 days).

One of the investors in this field has reported how the transport of cut carnations, under optimum test conditions, had required a constant temperature of 0.5 deg C, with 92% humidity, in a stable atmosphere comprising 93% nitrogen, 5% oxygen and 2% carbon dioxide. Mangoes (as another test case) needed a higher temperature of 10 deg C, with 90% humidity, and an atmosphere comprising 85% nitrogen, 10% carbon dioxide and 5% oxygen.

This has only been achieved through the installation of a very sophisticated system of selection and gas control. It does raise the question once the units have been operating for some time can this level of control be maintained.

RISKS

Not all produce benefits from being held under a controlled atmosphere regime. Also it has been found that not all varieties of the same commodity react in a similar manner. Therefore, before any commercial shipments are undertaken the correct atmosphere environment must be established according to the type and variety of produce concerned.

The produce can be suffocated if either the oxygen concentration is too low or the carbon dioxide concentration is too high.

CONCLUSIONS

Controlled and Modified Atmosphere systems are not a panacea for the carriage of perishable cargoes. It cannot make rotten fruit fresh again, but only preserve it in the condition which it is supplied to the carrier in the first place.

SUMMARY

With the implementation of the above legislative and technical changes, there may be an increase in the number of incidents reported, as stricter requirements are put in place throughout the cold chain.

There is no doubt, however, that every person through the cold chain should be made fully aware of their responsibilities.

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