

Cargo damage and prevention measures to reduce product damage in Malaysia.

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Abstract

Malaysia has grown from an agricultural/mining economy to a modern economy which includes sectors in manufacturing and transportation. The volume of Twenty Foot Equivalent (TEU) units used in ocean transportation by both importers and exporters have grown since the introduction of containers in world trade. An issue that exists is that cargo is damaged due to the shipper's lack of awareness of proper knowledge on how to prevent this as well as from handling of containers in manufacturer warehouses, hauliers or in port operations. This study attempts to identify a few industries in Malaysia, where cargo damage occurs and considers guidelines for external and internal container inspection as well as point to proper stuffing/unstuffing procedures to prevent cargo damage and minimise sea container damage in Malaysia.

Keywords: cargo damage, containers, contamination damage, infestation damage, physical damage, reefer related damage, wet damage.

1.0 Introduction

In sea transportation, optimisation surveys are needed, aimed at increasing the efficiency of the whole shipment cycle from seller to buyer (Hoseini, Omran, Márquez & Makui, 2018). 90% of global trade today uses sea transportation (IMO, 2019) and this study looks specifically at cargo damage in sea transportation. The use of containers was born of the need to reduce labor, time and handling in sea shipments. Containerization links the manufacturer or the producer with the ultimate consumer or customer. By eliminating as many as 12 separate handlings, containers minimize cargo loss or damage, speeds up delivery and reduces overall expenditure. (Bernhofen, El-Sahli & Kneller, 2013). We can define containerization as the technological change that arose from shipping goods via containers rather than through the traditional break-bulk method which was a character of international shipping before the introduction of containers. The ability to ship goods over long distances fairly cheaply had been in existence since the steamship and the railroad. The big bottleneck was getting things on and off ships. A large part of the costs of international trade was taking the cargo off the ship, sorting it out, and dealing with the pilferage that always took place along the way. However, in the process of using containers for sea shipments, cargo do get damaged.

2.0 Literature Review

The literature review considers how cargo damage may occur during a shipment cycle and the type and reasons why cargo becomes damaged in containerised shipments. In the process of moving containers, cargo and container may get damaged. Container damage on its own may also occur due to wear and tear over its use whilst cargo may be considered as damaged when it is received by the buyer in a condition that is worse than it was dispatched by the seller. Cargo damage may happen at any stage in a shipment cycle. It may happen:

- while cargo is in the possession of the seller,

- while cargo is being packed into a container,
- while cargo is being loaded onto a truck,
- while cargo is in transit by sea, road or rail,
- while cargo is being offloaded at delivery,
- while cargo is in the possession of the buyer

Cargo damage in transportation of goods in containers can take many forms such as physical, wet, contamination, temperature related, rodents and insect infestation and statistics indicate that a considerable portion of time can be taken up in handling container cargo claims. Studies have shown that 25% of the damage is physical, 14% temperature related, 11% containers lost overboard, 9% theft and 8% shortage (Miller, 2014) but classifications of cargo damage can be tabled generally as per Table 1 below.

Table 1: Classification of cargo damage

Type of cargo damage	Description of cargo damage
Physical damage	where cargo is damaged due to dropping, breaking
Wet damage	where cargo is damaged due to water
Contamination damage	where cargo is damaged due to contamination
Reefer related damage	where cargo is damaged due to reefer equipment or mishandling
Infestation damage	where cargo is damaged due to infestation

Source: (Manaadiar 2017)

3.0 Estimate of volume (or throughput) of TEUs moved in Malaysia in the last 5 years

Containers are often measured using the common Twenty Foot Equivalent Units (TEUs) measure and Table 2 shows the volume (or throughput) of TEUs moved in Malaysia over the last 5 years.

Table 2: Volume (or throughput) of TEUS in Malaysia

	2013	2014	2015	2016	2017	2018
Imports	3052903	3365976	3543493	3598905	3826358	4107809
Exports	3132344	3480476	3399898	3677869	3915802	4905075
Transhipped	7339322	148-6034	16257112	16612606	15593511	16068361
Total	13524569	21652485	23200503	23889380	23335670	25081245

Source: Website of various ports (Lembaga Pelabuhan Klang, Penang, Johor, Kuantan, Bintulu, Kuching) + Johor Port import/export numbers are estimates of Pasir Gudang and Tanjung Pelepas data.

Based on data from the World Shipping Council (2017), 130 million containers of freight are transported worldwide with an estimated 0.00797 % cargo damage, which includes lost containers at sea. If we take 25% (cargo damage) from the 0.00797% to Malaysia's 25081245 containers moved, we can estimate a potential of about 450 to 500 TEUs of cargo damage cases in Malaysia.

4.0 Conditions in Malaysia that relate to cargo damage and related cases of cargo damage

This section covers areas within a section of Malaysian industries and highlights the environment and industries where cargo damage can occur.

4.1 Precipitation levels and month average rainfall in Malaysia

Malaysia has a tropical climate all year round, however due to its proximity to water, the climate is often quite humid. Precipitation happens in the form of rain mainly, which falls or condenses on the ground from clouds. In Malaysia, precipitation ranges from a high of 366.94 mm recorded towards end of 2015 but averaged 254.80 mm from 1901 until 2015, reaching an all-time high of 542.90 mm in January of 2009 and a record low of 63.62 mm in February of 1987 (Trading Economics, 2019). Monthly precipitation in Malaysia for 2015 can be illustrated in Figure 1.

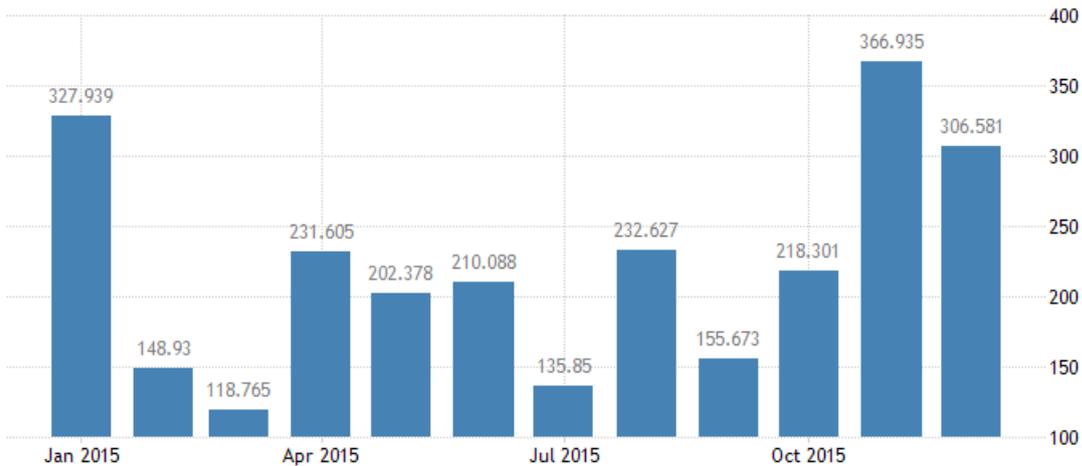


Figure 1: Malaysia monthly precipitation (2015)

Wet damage, as the name suggests, is damage to cargo due to wet conditions and water. Wet damage could be related to rain, condensation, moisture and seawater ingress into the container. Moisture and condensation in containers is usually caused due to changes in climatic conditions during transit through various climatic zones ranging from hot and humid to cold and freezing to wet and rainy. An analysis of wet damage claims on a global level, from 2008-2012 revealed that bulker and container vessels accounted for an average cost of USD55000 per claim (Malm, Enstrom & Hultman, 2013).

4.2 Wet damage in food and steel industry in Malaysia

Condensation happens when an incorrect type of container is used instead of a ventilated container. Trade Risk Guaranty estimates that 10% of all container shipments discarded are due to moisture-related damage (TRG, 2015). Moisture forms inside a container due to condensation (also known as Container Rain). Wet damage also happens due to water ingress into containers when there are holes in the container or the door sealing gaskets are not in good working condition. Wet damage can also happen on road/rail transportation due to condensation, moisture and rain.

Coffee beans, cocoa beans and wheat grain related products in food processing industries in Malaysia can become damaged due to wet conditions. The floor board of containers need to be aired for a week especially after washing and a coating of polyurethane will ensure a dry floorboard prior to loading of goods into the container. Coffee beans, cocoa beans and wheat grain tend to perspire and moisture tests need to be conducted, measuring the Relative Humidity (RH) at 18% or less to ensure conditions are right to prevent wet cargo damage. A food processor may also ask for grade A+ containers to ensure no past odors that may contaminate food products. Pallets used to store food products need to be elevated to be protected from flooding incidents but wooden pallets used in the industrial sector need to be kept dry, away from rainy conditions that might contribute to wet cargo damage.

Steel coils manufactured in Malaysia but exported to South Korea for the car industry may turn up with rust due to wet conditions too. The solution is to either hang absorbent bags in the container to absorb any water inside the container during transportation. Blankets may also be used to protect the steel coils or an absorption lining placed in the walls of the container to safeguard the steel coils from wet damage.

4.3 Dust and dirt physical contamination in rubber products and bad stowage

Exports of rubber bales from Malaysia to a European manufacturer of tires for example need to be also dust free to prevent physical impurities in the final product. Dirt or dust contamination as well as oily floorboards in containers will be rejected by the rubber bale importer.

Physical damage also happens when cargo packed inside a container experiences intense transverse forces and longitudinal forces during road, rail and sea transport. In sea transport, a ship may heave, surge, sway, yaw, pitch and roll (Hound, 2017) which causes the stuffed cargo to move about if they are not secured by chocking and lashing materials (GardNews, 2014). When shippers take short cuts to save cost and time, there will be impacts in cargo movement. Cargo damage is therefore also caused by insufficient packaging of the cargo that causes damage during transportation (Barr, Gjelsten & Steen, 2015). Hence, not properly packed cargo inside the container can become damaged if the cargo is allowed to move around inside the container. Road and rail transport is probably more stable. However, a crack on a railway line or bump of a road can cause cargo damage. Bad stowage of cargo is therefore, the biggest cause of physical damage to cargo whatever the mode of transport.

4.4 Smell contamination in medical glove transportation

Damage due to contamination is when the cargo has been contaminated through poisoning or pollution which makes the cargo unsafe for industrial use or for human consumption. Contamination can take place in both solid and liquid states, whether cargo is loaded in a standard International Standards Organization (ISO) container or in an ISO tank container. Contamination has been identified as the primary cause of ISO tank container claims (Manaadiar, 2014). Odour causing contamination of cargo also occurs commonly with dry cargo in a standard ISO container. Odour transferred from one container to another, stacked next to each other is also referred to as adjacency risk. In the transportation of coconut oil, the cargo is stacked, shrink-wrapped and packed into a freight container (also called IBC or Intermediate bulk containers), but because of adjacency risk, odour from an adjacent container may be transferred, such that the consignee is not able to use the same IBC to carry another batch of coconut oil. Delicate cargo such as clothing, food products, shoes or commodities such as coffee, tea, tobacco and cotton are highly susceptible to adjacency risk and damage due to odours (Miller, 2014). A shipping line may have released an empty container in structurally good and sound condition to the shipper but odours transferred could be a cause of contamination.

For example, in Malaysia, latex from rubber trees emit smells that need to be removed for medical glove production. The use of dry containers is crucial during transportation and shippers need to avoid containers that has odor or even the smell of fresh paint. The use of second-hand pallets also need to be closely scrutinized and it is best to stay clear of pallets that have noticeable stains from past use that may contaminate such products.

4.5 Reefer cargo damage and food produce damage in Malaysia

Forms of reefer cargo damage can be from freeze damage, thawing, decay, discolouration, bruising, over-ripening and/or off-size cargo. Transportation through multiple marketing channels such as for food products, may be handled many times from production facilities to consumers. From production to consumption, food packaging provides containment; protection toward the products' physical, chemical, and biological needs (Singh & Singh, 2019). Often, power failure or the malfunctioning of reefers cause reefer cargo damage. The improper setting of temperature (set as frozen instead of chilled and vice versa) could be the cause. In most cases, unintentional human error such as mixing negative (minus) and positive (plus) settings in cargo temperature settings could be the cause. Early or late harvesting of food produce for export may also cause cargo to deteriorate. Products that may be affected could be onions, garlic, dry chillies and potatoes for example.

4.6 Infestation damage and related cargo damage products in Malaysia

Infestation happens when insects or animals (rodents) cause damage to cargo and they could bring along diseases. Besides contaminating cargo, infestation can also result in delays when port health authorities inspect the cargo. This is evident in the shipment of agricultural products and infestation in containerized cargo could happen through transfer of pests from an infested warehouse where the cargo was stored (Talleur, 2013) or through insects moving into one container from other containers or cargo (another form of adjacency risk). Or through insects present in the floorboard of containers from a previous cargo. Infestation may come from the floor board of a container and when cargo is stored for long periods at container depots or warehouses, insects and rodents may be attracted. This requires fumigation as a solution. There are many certified companies as well as enforcement agencies in Malaysia that will guide procedures for checking of containers as well as propose quarantine and appropriate steps to resolve the issue.

5 Recommendations for future study

This paper is a concept paper that aims to highlight some cases of cargo damage within the Malaysian environment. A more comprehensive study is required to collect data on cargo damage for the many industries where cargo damage is occurring. The findings will allow the Malaysian government to introduce guidelines that may prevent physical, wet, contamination, reefer and infestation cargo damage. Future research could also include incidence of container damage and handling of containers from ports to consignees and introduce best practices (preventive measures) for container damage. Industry players will also be able to reduce cargo and product damage and some guidelines can be found by reading the Cargo Transport Units Code or CTU Code (IMO/ILO/UNECE, 2014) for internal or external container inspection, as well as for suggestions on proper stuffing/unstuffing procedures to prevent cargo damage and minimise claims for sea container damage in Malaysia.

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