



Japan-ASEAN Cooperation



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AFFA

Project Transportation Management

Part IV



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Cargo Transportation

Objectives:

The objective of this section is to provide the student to understanding of stowage planning, functions of packaging (IMO/ILO packaging standards), container or CTU securing and transport costing



Cargo Transportation

Stowage Planning

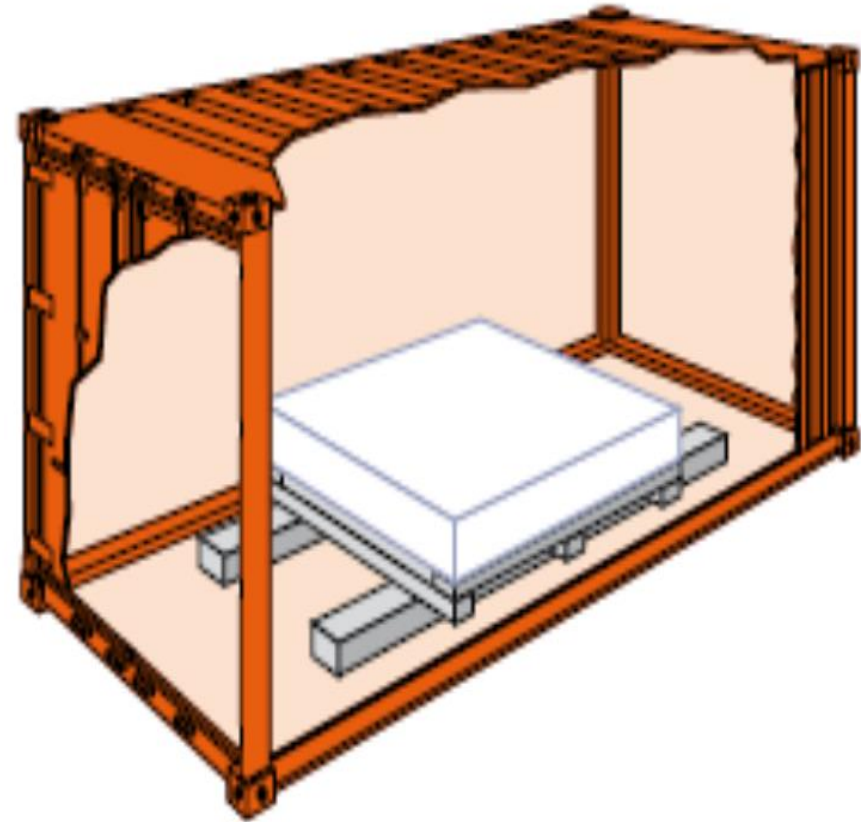
There are three main reasons why it is important to **formulate a stowage plan before packing**. Precise details of the **packaging, weights and dimensions** of the cargo, as well as the **container's internal dimensions and weight restrictions**, are required before a stowage plan can be formulated -

- a) To achieve **optimal capacity utilization** of containers
- b) To **simplify and speed up loading/unloading**
- c) To **calculate the necessary lashing materials** promptly in advance

Cargo Transportation

Length wise:

Wooden beams
are required for
**bedding heavy
cargo.**



Courtesy: Hapag-Lloyd AG



Cargo Transportation

Before drawing up a stowage plan, **a suitable container has to be selected**, taking into consideration the following factors:

- a) Load limit and permitted weight distribution of container**
- b) Weight restrictions for inland transport in country of sender and recipient**
- c) Recipient's abilities to unload cargo from container**



Cargo Transportation

Functions of Packaging

Packaging has to:

- 1. Protect cargo**
- 2. Enable cargo to be stacked**
- 3. Enable cargo to be lifted, moved and secured**
- 4. Provide information on cargo characteristics and proper and effective handling**



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Cargo Transportation

The **Container itself is the means of transport.**

Cargo must, therefore, generally be **packed for transport in containers.**

The **type and quantity of packaging** required depends on the type of transport and container used.

If items of **cargo of various sizes and weights** are stowed together, more stable packaging is required.

If cartons or crates are **stacked in several layers** on top of one another, the **lowest layer must be able to withstand the weight of the items stacked above.**



Cargo Transportation

The **requisite stack strength** depends on the **packaging material, transport time and moisture condition**.

Standard containers can be given **linings for bulk freight cargo**, rods for clothing or moisture-absorbing materials.

If the cargo is loaded in **open containers or on flat-racks**, the **packaging must withstand influences from the climate, weather and transshipment during the entire transport process**



Cargo Transportation

General Guidelines for Packing a Container

- Cargo of the following types **must not be packed together**
- **Dusty goods** with **dust-sensitive cargo**
- **Odour-emitting** with **odour-sensitive cargo**
- **Moisture-emitting goods** or packaging with **moisture-sensitive cargo** or packaging
- Items with **protruding parts** (e.g. sharp corners, edges) with goods in comparatively soft and sensitive packaging (e.g. sacks or bales)

Cargo Transportation

- **Moist goods with dry goods**
- **Heavy packages should not be stacked on top of light package**
- **Lashing eyes on corner posts**, For fastening ropes, plastic straps, metal brackets, roof and floor longitudinal quick-acting locks, etc. (for load restrictions, see beams or rings in floor.
- **Corrugation in side walls** For securing cargo lengthwise. **Timber lying crosswise can be wedged in the corrugation.**
- **Corner posts for chocking heavy items of cargo to prevent horizontal slipping.**

Cargo Transportation

Know the Parts of container

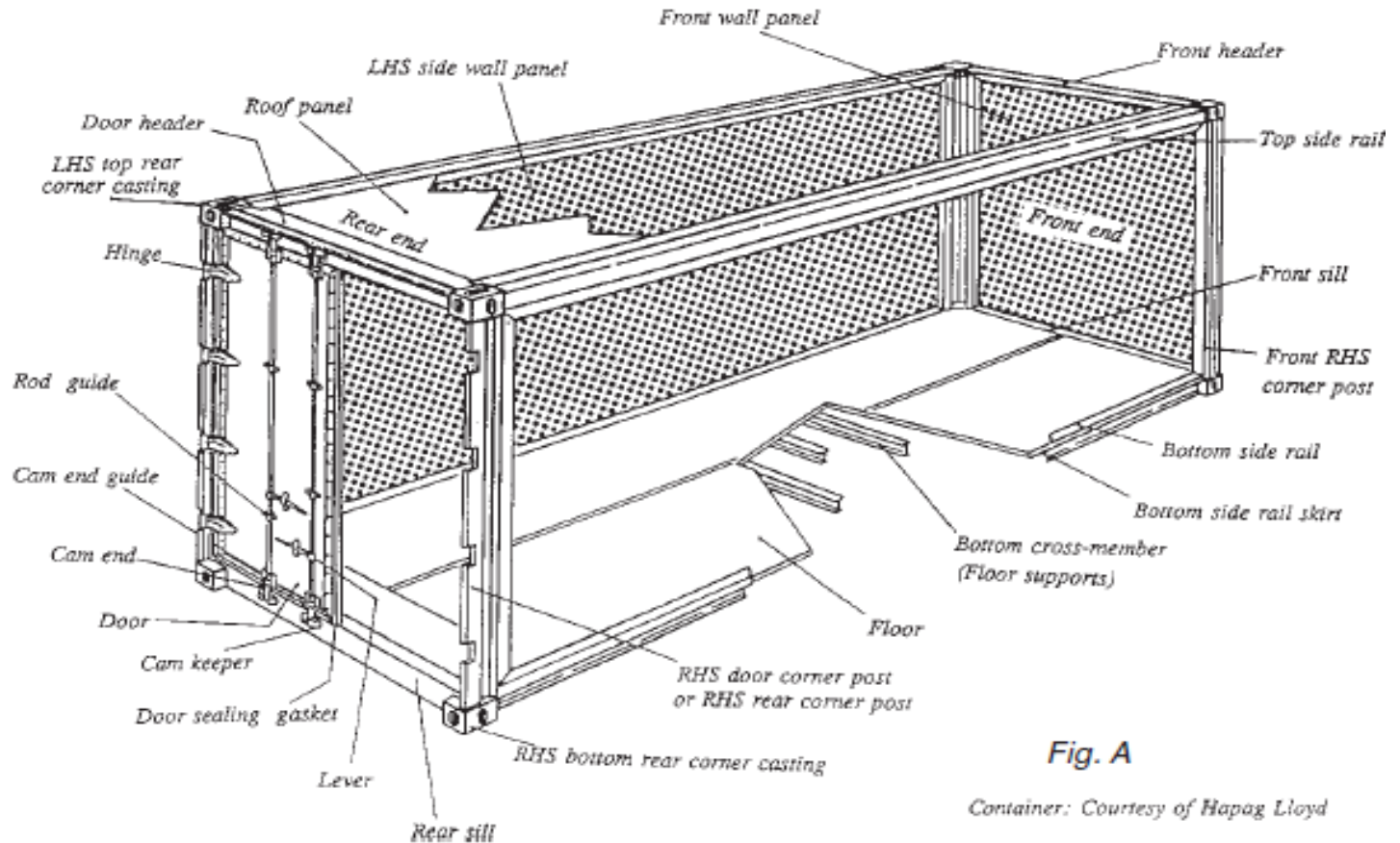


Fig. A

Container: Courtesy of Hapag Lloyd

Courtesy: UK P&I Club

Cargo Transportation

Poorly Stuffed Coil



Photo 3. Note the damage caused to the container by the poorly secured coils

Courtesy: UK P&I Club

Cargo Transportation

Another Poorly Stuffed Container

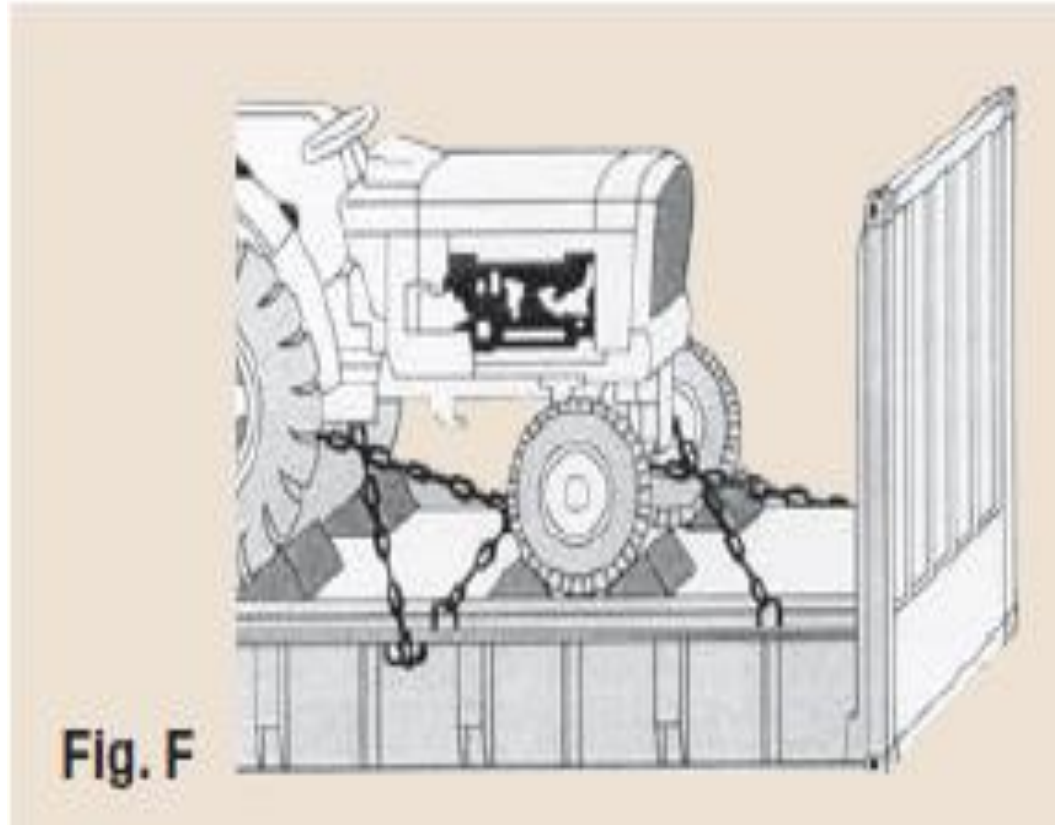


Courtesy: UK P&I Club

Photo 1: Poorly stuffed container – note the damaged packages, the pallet on top of cartons and the apparent lack of securing arrangements

Cargo Transportation

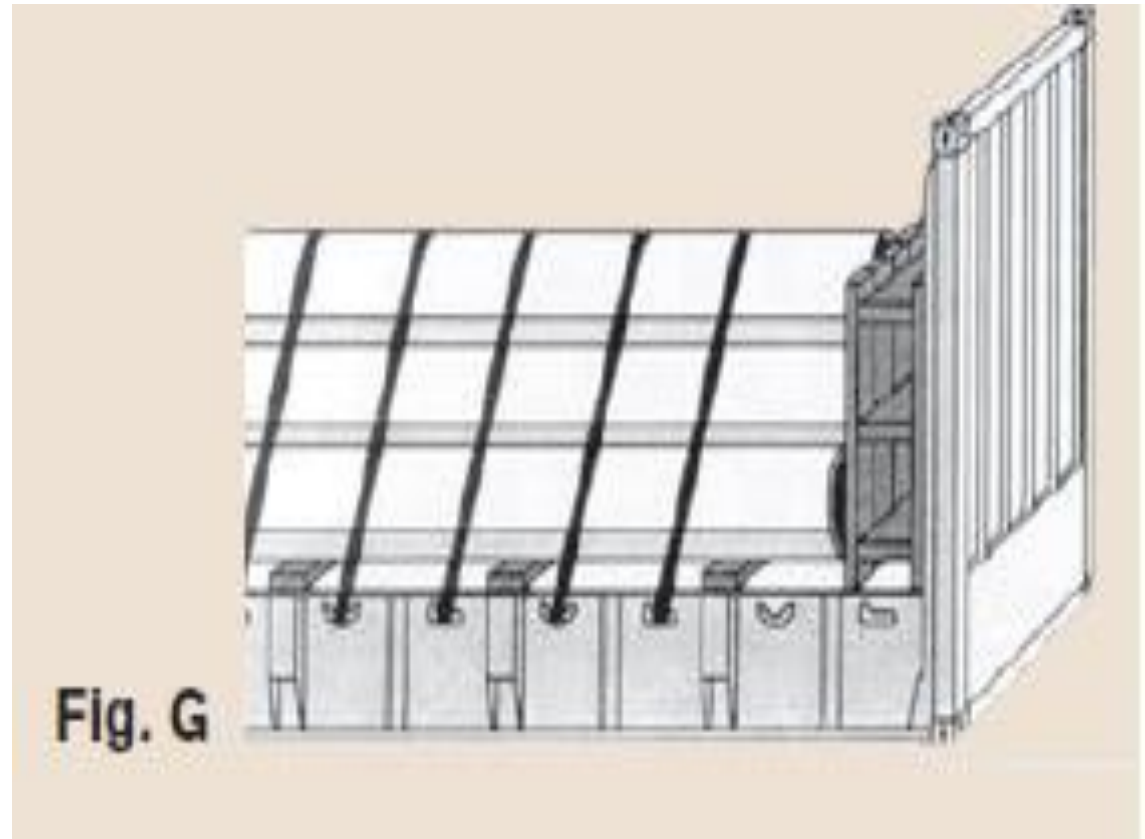
Well secured Cargo



Courtesy: UK P&I Club

Cargo Transportation

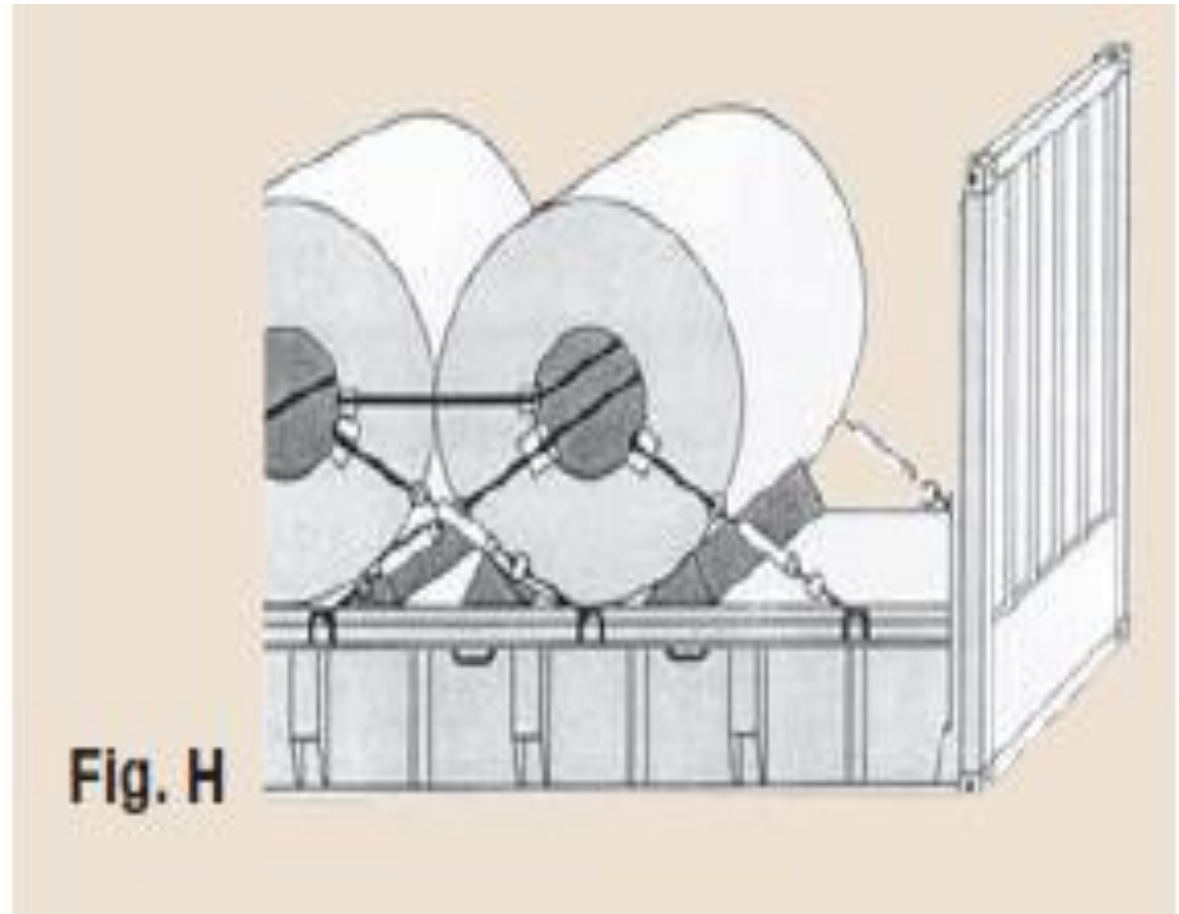
Example of secured shipment



Courtesy: UK P&I Club

Cargo Transportation

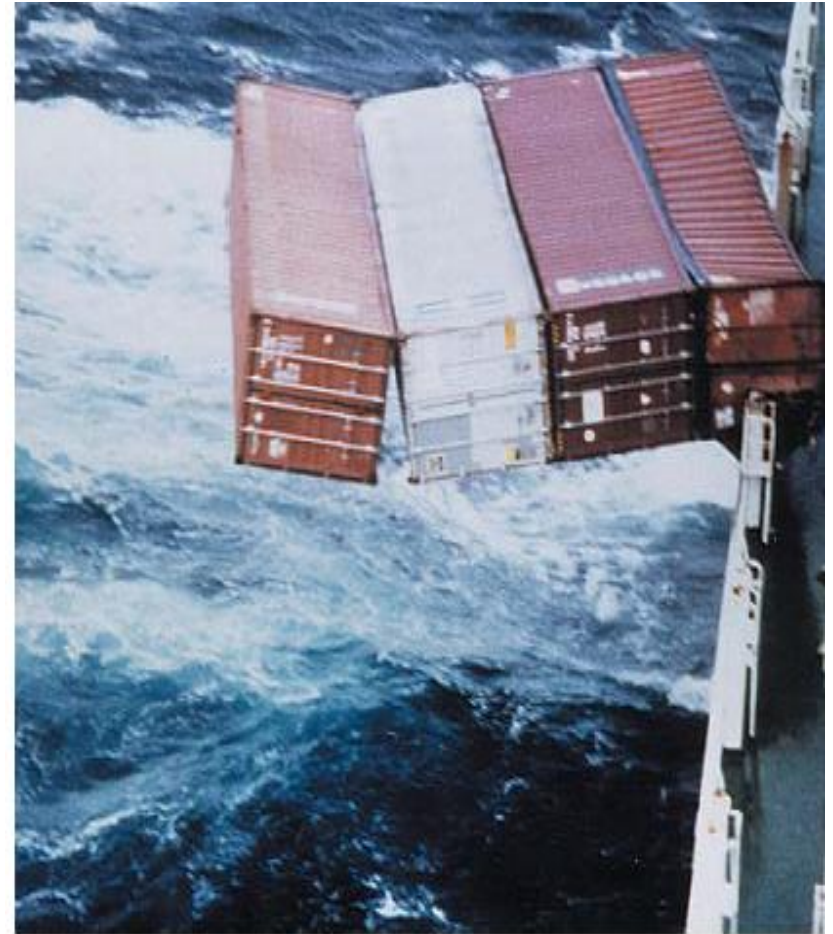
**Coils loaded into
A flat rack with
Proper lashing**



Courtesy: UK P&I Club

Cargo Transportation

The Final Failure!
The last straw on lashing



Courtesy: UK P&I Club

Photo 5: The ultimate lashing failure



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Cargo Transportation

General Rules for Securing Cargo

When packing a container or securing cargo, the Guidelines for Packing and Securing Cargoes in Containers for Transport by **Land or by Sea (Container Packing Guidelines)** issued by the International Maritime Organization (IMO) and International Labour Organization (ILO), must be observed.



Cargo Transportation

Unlike cargo securing as is usual for land transport, cargo carried by sea must also **be secured within a container against all ship movements**, such as **rolling, pitching and yawing**.

The best way of securing cargo is **to distribute it without any gaps over the entire floor**.



Cargo Transportation

If gaps cannot be avoided, the space between the packaging and container walls must be **filled using air bags, dunnage or other stowage material.**

Individual cargo parts that can not be filled up, it must be secured by being **chocked and lashed to the floor**
Lashing eyes are provided on the longitudinal beams on the floor, roof and corner posts.



Cargo Transportation

- **Containers are controlled at every interchange.** In addition, it is recommended that a careful check of the following items after receiving a container:
- **External checklist:**
- There are **no holes or cracks** in walls, floor or roof.
- **Doors are easy to operate.**
- Locking **devices** and handles **function properly.**



Cargo Transportation

- **Customs seal** device must be in orderly condition.
- **No self-adhesive labels from previous cargo** (e.g. IMDG placards);
- **DG stickers** are permitted **only** if there are dangerous goods in the container
- **Current issues facing lines: over-weight and poorly stuffed containers**



Cargo Transportation

- As noted many project shipments are **sent to the developing countries with limited special equipment readily available**;
- Delays can be prevented **if preparation** is made in anticipation of **any unexpected eventuality**;
- Where procedures are spelled out; it should be adhered to; especially where **local authorities are not prepared to be flexible in interpretation of rules and regulations**;



Cargo Transportation

In summary, the following considerations should be adhered to as **most project or shipment differs**. Many **different factors** are involved in such operations; **different environment** may require different approach or solution to the problems **especially through third country operations**.



Cargo Transportation

The Principle of Unit Loads

- **Goods should be kept together** in form of a transport unit adapted to all present vehicles and handling equipment.
- The unit **should be formed as early as possible** and **be broken as late as possible** in the material flow.
- Preferably should be **formed at the consignor's, and broken at the consignee's.**



Cargo Transportation

Unit Loads

- Unit loads are **parts of a shipment** that can be **treated as a single unit** during cargo handling and transportation.
- The **size or dimensions of the unit load can vary** according to requirements and to the means of transport and packaging container available.
- To optimize the cargo handling, transport and storage processes, **standardization of unit loads is desirable.**



Cargo Transportation

The most **common unit loads** are **pallets and components with bases** that resemble pallets.

The most important properties of a unit load are:

- 1) that it **can be loaded to ensure a tight fit,**
- 2) its **modularity and its stability,**
- 3) it **can be stowed safely and will not be damaged by load securing measures.**



Cargo Transportation

Costs Of Using Unit Loads

- Need for **technical adaptation**
- Need for larger and more **costly transshipment equipment**
- **Economies of scale cause less flexibility**
- Extra costs for unit loads and **empty positioning**



Cargo Transportation

Costs Analysis of Each Phase of The Operations

- **transport costs**: road; rail; barge or ship
- **hire of special equipment**; duration required
- issue on **availability of such equipment** at certain locations
- **Costs of storage at each phase** of the project as indicated
- **Costs of local procedures** e.g. removal of obstacles



Cargo Transportation

Detail Analysis on Transportation Costs:

- **Shipping costs** based on special ship will be negotiated
- **Shipping costs** on containers require an understanding of the shipping routes involved;
- Issue on **transshipment**
- Issue on **container detention and demurrage charges**;
- Where applicable; **if 2nd hand units can be used**



Cargo Transportation

Conclusion

Cargo packing and handling is a very important part in the chain of transportation. The freight forwarder must be able to address the issue stowage planning, understand the cargo securing methods and also basic compliance to the IMO/ILO standards.