



Japan-ASEAN Cooperation



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AFFA

Project Transportation Management

PART II



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Cargo Transportation

Objective:

Once the freight forwarder has size up the cargo, the next process would be to ensure that the loading port has the facility to handle the cargo or goods. In this sections we will also discuss on the hazards working around cranes, shipment via rail transportation and also RoRo vessel.



Cargo Transportation

Preparing The Site At The Loading Port

1. Is there sufficient space at the wharf apron to keep the cargo?
2. Many smaller ports may not have the required strength to keep stationary heavy load at the wharf side;
3. Many wharfs are designed with an average load factor of some 3 tons per sq. m. for moving loads; [in Malaysia, container wharf is generally designed with a pile-head strength of 150 ton]

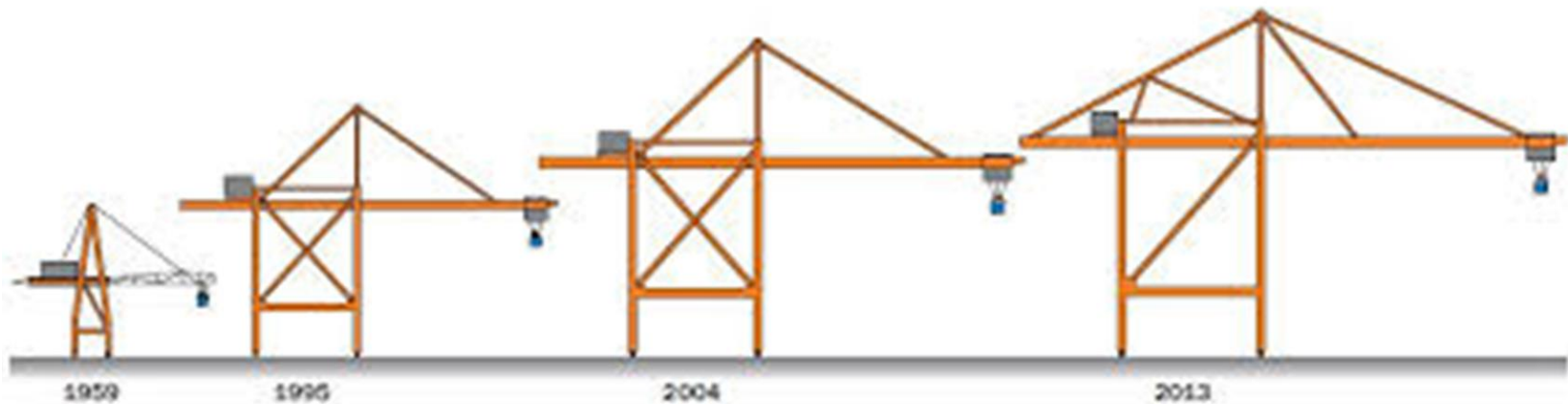


Cargo Transportation

4. Storing away from the wharf apron will mean double shifting or handling of cargo; incurring additional costs.
5. Is the loading-ship equipped to lift the heavy-lift with her on board crane/s?
6. If not, is shore crane available at the port?
7. Shore cranes that are normally mobilized from outside the port premises involve additional cost of mobilization;
8. Though many larger ports may have modern quay container cranes that can offer an alternative to mobile cranes.

Cargo Transportation

The Changing Size of Quay Cranes since containerization
in the late 60s to date



Source: cranetodaymagaine.com

Cargo Transportation

Latest Quay Crane in comparison with the common mobile shore crane



Cargo Transportation

**Working on the wharf Apron:
with space limitation**



Courtesy: [en'wikipedia.org](https://en.wikipedia.org)

Cargo Transportation

**Using Ship Cranes
Can be cheaper when
Compared to mobile
Shore cranes**



Courtesy: worldmaritimenews.com

Cargo Transportation

Working at Wharf Apron with Twin Shore Mobile Cranes



Courtesy: whytecranes.com

Cargo Transportation

Floating Crane Working Along-side Wharf



Courtesy: Media Gallery USA

Cargo Transportation

**Small narrow wharf apron;
many Ports still operate
with such Facilities:
Designed with rather
limited tolerance for
heavy loads**



Courtesy: guttendarcades.blogspot.com



Cargo Transportation

Is the wharf sufficiently built to handle such crane?

Out-riggers may be required

Are **steel plates** required to rest to support those out-riggers?

What is the **cost of such arrangement?**

Is there a better alternative?

Cargo Transportation

Crane equipped with out-riggers.
With the mobile crane resting on the out-riggers thus releasing pressure on the tires.

Courtesy: ditzj.de



Cargo Transportation

Crane with extended Out-riggers of Different Length



Courtesy: ditzj.de

Cargo Transportation

**Out-riggers with
Expanded
Support base**



Courtesy: p3planningengineer.com

Cargo Transportation

An Improvised Out-rigger Support



Courtesy: elcosh.org

Cargo Transportation

**Using purpose
designed
Pads to
Re-enforce
Out-riggers**



Courtesy: willmarsh3.net

Cargo Transportation

Pads Designed for Out-riggers

Pads Plates for Outriggers

Specifications:



Model	Dimensions	Weight	Max Load
ALMP300-30	300x300x30mm	3 kg	6000kg
ALMP600-60	600x600x60mm	15 kg	20000kg

Courtesy: taslifting.com.au

Cargo Transportation

**Avoiding Pressure
On the tires
Of the Crane;
resting
On elevated
Out-riggers**

Courtesy: forums.dhscdiecast.com



Cargo Transportation

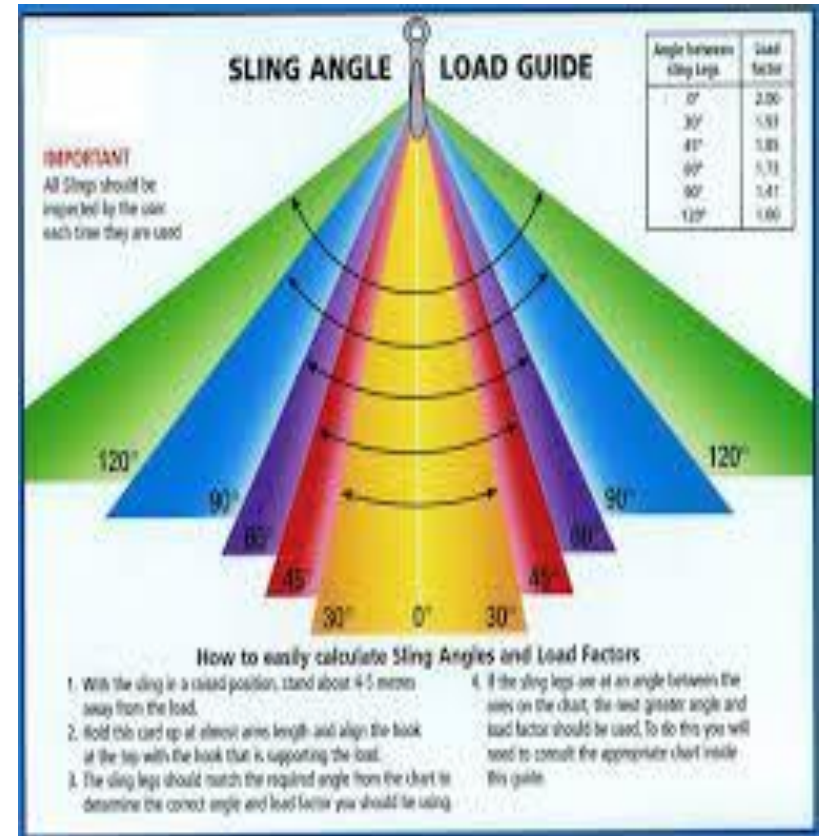
Improvised pads used for out-riggers such practice may prove dangerous and unsafe.



Courtesy: cranelicense.blogspot.com

Cargo Transportation

Safe Working angle:
Note the term:
SWL or Safe Working Load
Indicated at 25 degree





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Cargo Transportation

Safe Working Load

SWL	Test load
Up to 20 tonnes	25 percent in excess.
20 to 50 tonnes	5 tonnes in excess.
Over 50 tonnes	10 percent in excess.

Courtesy: osha.gov.com

Cargo Transportation

What Happened?



Courtesy: craneblogger.com

Cargo Transportation

**This can be
the consequence
when the basic rules
are not observed**



Courtesy: liftequipmentsafety.blogspot.com

Cargo Transportation

Working around cranes can cause the above mentioned accidents; signage may be required



Courtesy: Elcosh=CPWR

Cargo Transportation

**Another
signage
when
working
near a
crane**

Courtesy: Elcosh





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Cargo Transportation

Hazards of Working Around Cranes

Key Concepts:

- **Electrocution Hazards**
- **Caught-In, Compressed or Crushing Hazards**
- **Struck-By Hazards**
- **Other Hazards**

Courtesy: ELCOSH-CPWR



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Cargo Transportation

Hazards of Working Around Cranes

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Courtesy: ELCOSH-CPWR



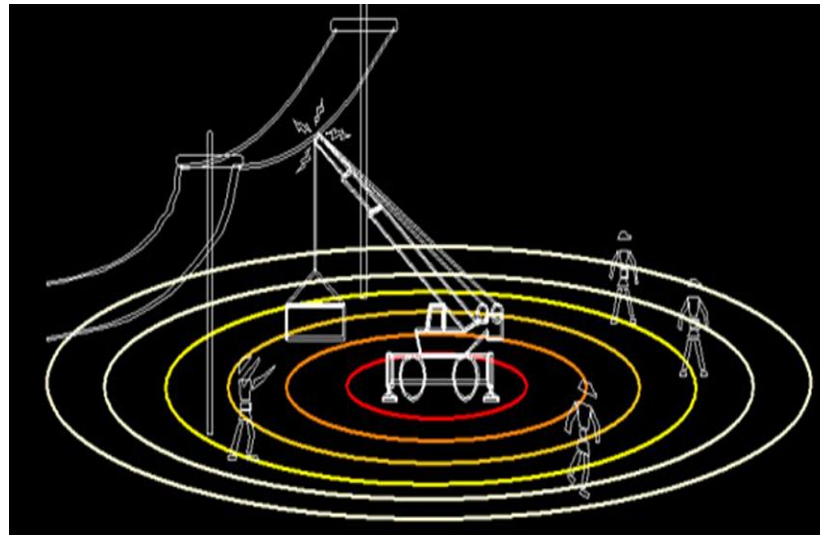
Cargo Transportation

Controlling the Problem:

- OSHA (Occupational Safety and Health Academy) power line clearance distances.
- ANSI (American National Standards Institute) requirements for working around power lines.
- Safe working clearance distance for cranes.
- Preventive measures for avoiding power line contacts.
- Planning for power line hazards.
- Dealing with power line emergencies.

Cargo Transportation

Dealing with power line emergency



Current can flow outwards through the
ground

Courtesy: Elcosh



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Cargo Transportation

1. Know Your Crane
2. Crane Signals

Cargo Transportation

From left to right

1. Recommended
2. Not Recommended
3. Recommended

Shackles should
Be checked

Improvisation
Should be
avoided



Courtesy: Elcosh

Cargo Transportation

Proper Use of Shackles

Avoid eccentric loads.

1. On the Left : Bad
2. On the right: Correct

Courtesy: Elcosh

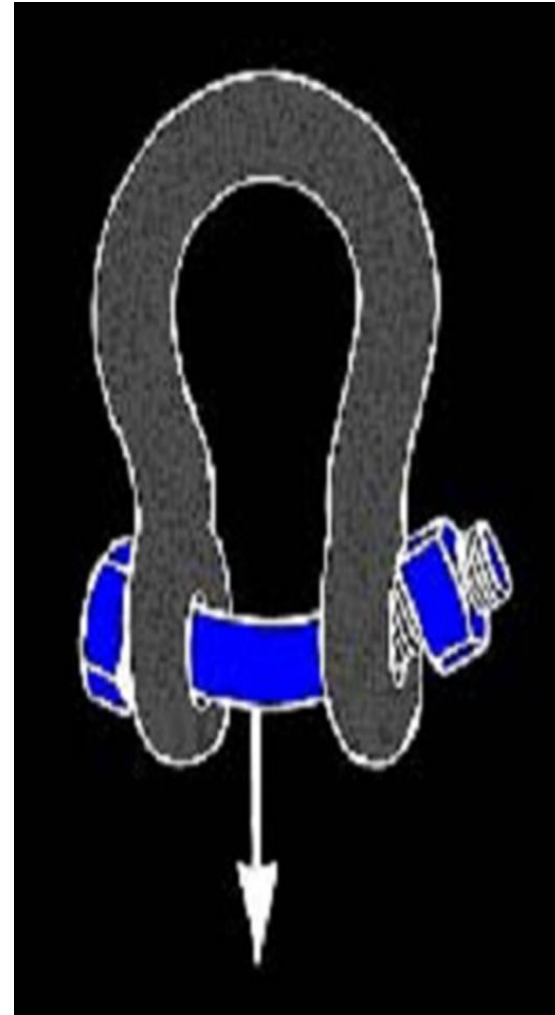


Cargo Transportation

Proper Use of Shackles

Never replace a shackle pin with a bolt.

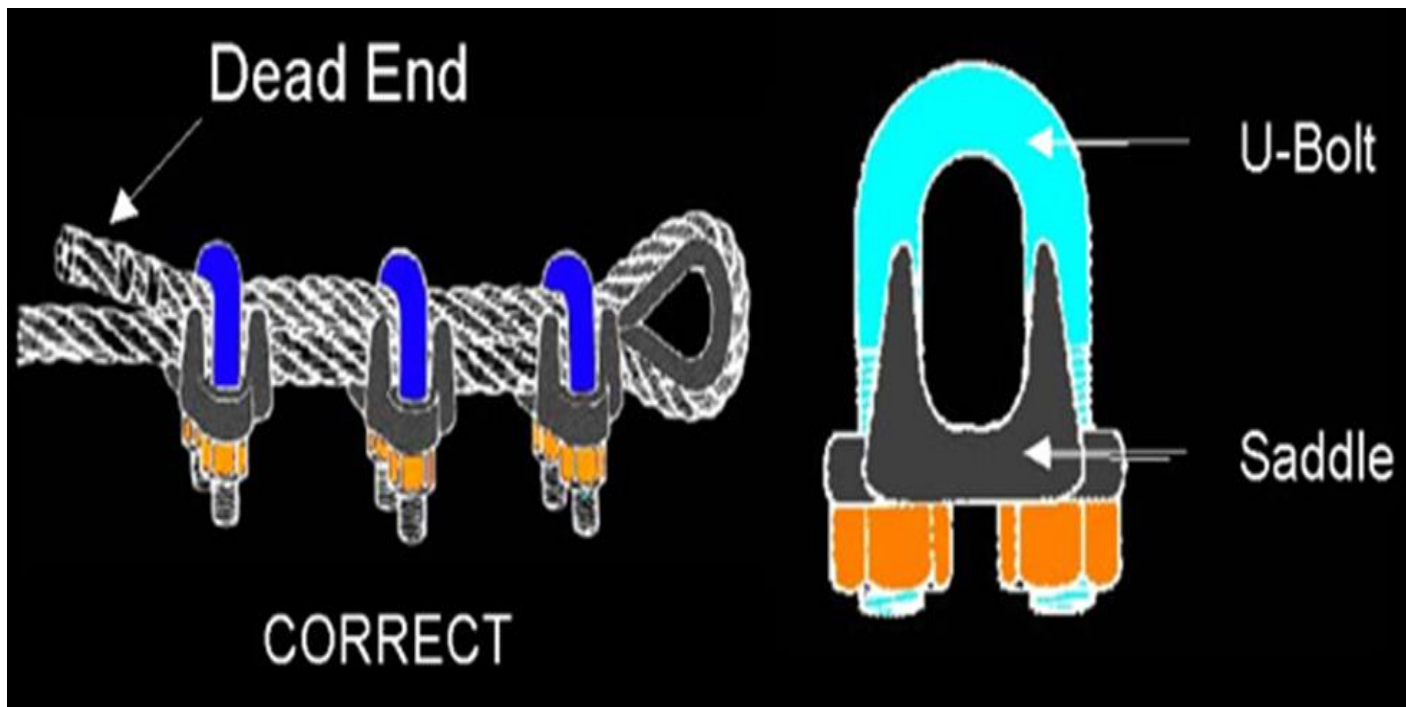
The load will bend the bolt



Courtesy: Elcosh

Cargo Transportation

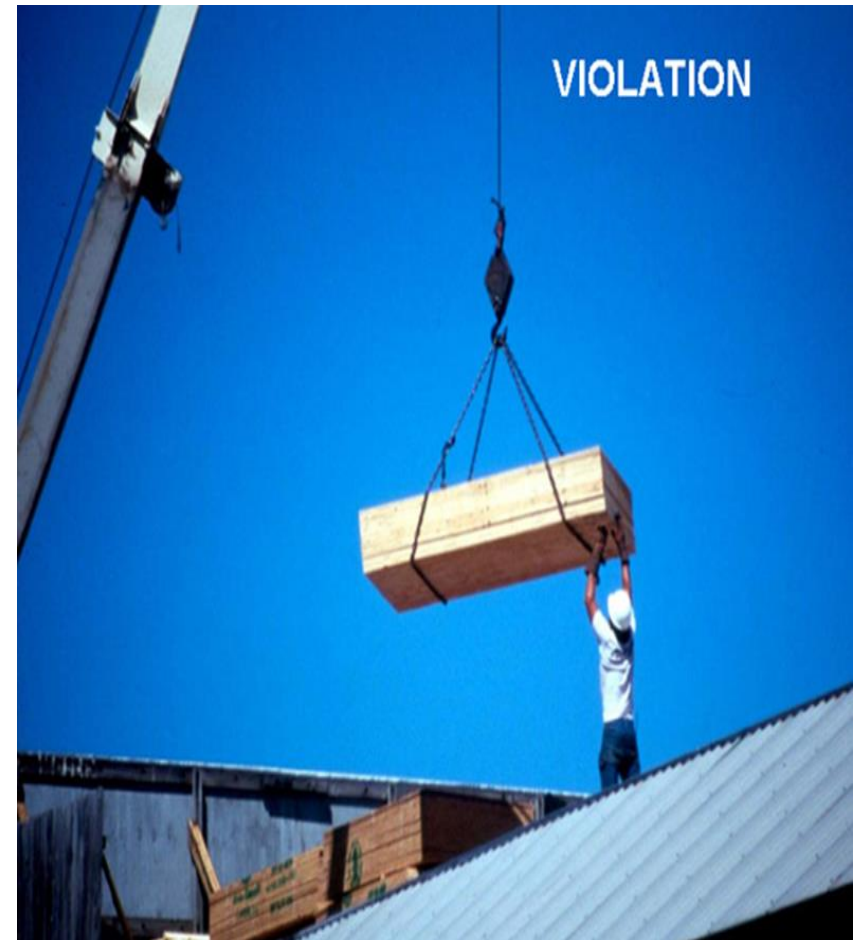
Correct way of Installing wire rope pin



Courtesy: Elcosh

Cargo Transportation

Violation of Basic Practice



Courtesy: Elcosh

Cargo Transportation

**Handling Heavy lifts
Through lesser
Developed
Location**



Courtesy: heavyliftspecialist.com

Cargo Transportation

Or on
very
tough
terrain



Source: demoffhighway.com

Cargo Transportation

Lesser developed

Location

What are

The Possible

Problems?



Courtesy: heavyliftnews.com



Cargo Transportation

- Over long distances, the combine transport of rail-road may prove more competitive;
- This is true of large landmass countries: Russia; China: USA; Canada and India
- Rail rate has been proven much cheaper than road over long distances
- It is a combination of speed and availability



Cargo Transportation

According to the Ministry of Transport of China; the following rates were recorded from Chongqing to Shanghai:

- Road : RMB20,000 per teu 3 / 4 days
- Rail : RMB6,000 per teu 4/5 days
- Barge : RMB2,000 per teu 8/11 days

Cargo Transportation

Loading by rail



Source: iran-trading.de



Cargo Transportation

- Though many European and US ports are directly rail-linked but many Asian ports; in spite of the large volume of cargo movement seldom use this mode of rail-road combination;
- For example in China only the port of Qingdao is originally rail-linked; most of the container ports are served by road mode
- At Port Klang, only the older wharves are rail linked; indicating the lesser use of rail for goods transportation



Cargo Transportation

Shipment Of The Cargo:

Is the ship **a specialist vessel** built for such purpose?

Are all the cargoes readily **available to be loaded**?

Delay may incur **demurrage charges**, understand the terms and conditions of the charter party;

Are all **basic gears** on hand **with spares** in case of unexpected breakdowns?

Chartering specialist ship may require chartering consultants to finalize the arrangement.

Cargo Transportation

Such ships used to ply short-sea route with on-board cranes



Courtesy: maritimejournal.com

Cargo Transportation

**Samples of large
quay cranes
being delivered
fully built.
Notice the
Tug-boats
Pushing the ship.**



courtesy: heavyliftspecialist.com

Cargo Transportation

Examples of large heavy units being loaded by double cranes working simultaneously

[Video Crane Handling](#)

Courtesy: arabianindustry.com





Cargo Transportation

Issues with Storage at Port of Loading

- **Suitable space** requirement; ground condition
- **Total space** requirements; can it be hired incrementally if so required
- **Distance** to the point of loading i.e. to the wharf
- **Equipment requirement** for this operation
- **Supervision** on receiving and delivering of cargo
- With busy terminals, penalties may be imposed for **waiting or delays** etc

Cargo Transportation

Storage space within most terminals

is very limited with premium rates; Many wharves even with container operations average only 45m-50m in width.

Courtesy: smc-pro.com



Cargo Transportation

**Many types of ship
may be used;
this is a specialist
Heavy-lift ship**



Courtesy: DFDS Group

Cargo Transportation

Another picture showing **the width of Multi-purpose wharf**
Average load allowed is some **3 ton p/sq. m**



Courtesy: en.Wikipedia.org

Cargo Transportation

Such loads being **railed**
for direct loading or
 Unloading are often
 permitted as the **railway**
track on wharf is
normally strengthened



Courtesy: Trans-trading.uk



Cargo Transportation

Shipment by rail will depend on the fact if the delivery site is rail connected;

- otherwise **additional handling** is required;
- whether rail service can handle the **unusual heavy unit** will depend on a number of factors:
- **dimensions**; weights as the route may pass through
- **tunnel/s, bridges** and maybe **connecting stations**.



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Cargo Transportation

Heavy Units of limited dimensions hauled by rail



Courtesy: midwestheavyhaul.com

Cargo Transportation

Loads by rail are normally within the normal gauge of the railway system



Courtesy: railynews.com

Cargo Transportation

**Where the rail
line has
no height
restrictions**



Courtesy: American-rails.com

Cargo Transportation

Such structures can impede the use of the rail services for **Over-sized cargo**



Courtesy: en.wikipedia.org

Cargo Transportation

Such **tunnels**
will limit the
use of the
rail line



Courtesy: geography.org.uk

Cargo Transportation

Though **stationary load** like this one; **may not be permitted** in some ports for even over-night stay. Why?



Courtesy: Hansa Meyer.bloodspot.com

Cargo Transportation

By Ro-Ro Barge

Example:

Exports of mills
to certain locations

in Indonesia from
Port Klang

Courtesy: DFDS Group

By Ro-Ro Vessel

[Courtesy of Wilhensem Shipping](#)

[Meet the new Mark V - WWL's](#)

[new generation](#)

[roro vessels](#)





Cargo Transportation

CONCLUSION

When arranging for export, consider the following points:

- Suitability of the ship
- Loading into the ship; gears availability
- Do remember that many such cargo may be destined to developing countries with limited facilities at their ports
- Searching for or getting the required gears or equipment may pose a challenge!!