JAPAN P&I CLUB
日本船主責任相互保険組合

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JAPAN P&I NEWS

To the Members

SAFE LIFTING OF ISO CONTAINERS AND TANKS USING HOOKS AND WIRES

We have obtained information on safe lifting of ISO containers and tanks using hooks and wires by the International Cargo Handling Coordination Association (ICHCA). For details, please find attached their safety alert.

Yours faithfully,

The Japan Ship Owners' Mutual Protection & Indemnity Association

Attachment: SAFETY ALERT SAFE LIFTING OF ISO CONTAINERS AND TANKS USING HOOKS AND WIRES (issue 2) by ICHCA

SAFETY ALERT

SAFE LIFTING OF ISO CONTAINERS AND TANKS USING HOOKS AND WIRES (issue 2)

The following has been compiled to provide an overview of some of the safety principles associated with this type of operation. It can only provide a general perspective. Any lifting operation of this type should be undertaken by competent persons in compliance with applicable regulatory frameworks and is the responsibility of the duty holder.

Introduction

The use of gantry cranes and spreaders is the optimal and preferred method for lifting ISO containers and tanks (collectively referred to as Cargo Transport Units, CTUs) in most situations.

However, not all terminals have this equipment available. At some terminals it is therefore accepted practice to lift ISO containers and tanks using wires or chains and single-rope cranes, such as mobile harbour cranes (MHCs)[1] or barge-mounted derricks.

Safety should always be considered in any lifting operation and this alert sets out some key principles when lifting any cargo including containers by hook and chain or wires.

Principles

- When handling ISO containers only methods allowed in ISO 3874 should be used. In general, lifting a packed ISO container by the top corner fittings requires a spreader or vertical slings or chains. Angled slings should not be used.
- In the case of a single-point lift, special attention should be paid to the risk of the container tilting owing to asymmetry of the centre of gravity.
- The load should be as secure in the air as it is on the ground.
- The slinging method should be suitable for the load to be lifted, with adequate means of attachment to both the load and the lifting appliance[2].
- The mass of the load must not exceed the safe working load (SWL) of the slinging gear or lifting appliance.
- The load must not damage or be damaged by the slinging gear.
- Lifting operations should be planned by a competent person.
- Never work under a suspended load.

[1] Mobile Harbour Cranes and other jib cranes may be equipped with a single wire hoist cable or double hoist cables. Both can be considered as a single rope crane terminating in a single lifting hook or attachment.

[2] Lifting Appliance = all stationary or mobile cargo-handling appliances, including shore-based power-operated ramps, used on shore or on board ship for suspending, raising or lowering loads or moving them from one position to another while suspended or supported

Lifting freight containers

The preferred method for lifting a packed freight container is to use a spreader which connects directly into the top corner fittings of all ISO containers and often regional or national designs. Where a MHC is to be used then the spreader can be attached directly to the load block (Figure 1).

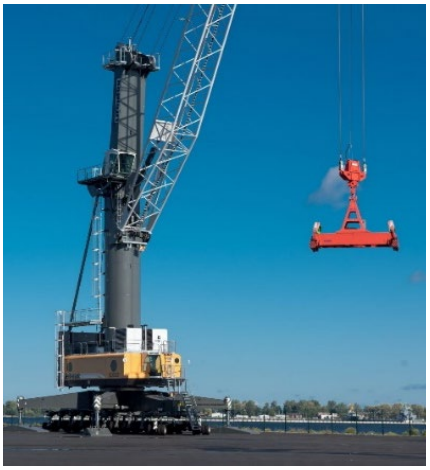

Figure 1

Sometimes it is impossible to attach the spreader directly to the top of the container in which case, consider using vertical chains attached by hooks into the top and end apertures (Figure 2) or corner fitting lugs (Figure 3).

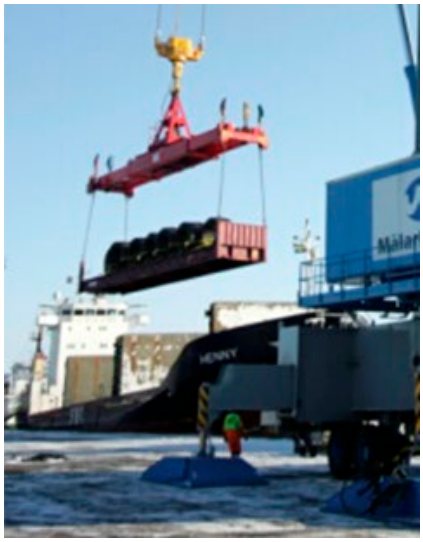

Figure 2

Figure 3

For a flatrack lift, as shown above: wires should be vertical and attached to the top corner fittings. The centre of gravity should be below the top corner fitting.

For example, a very small 5^{o} degree vertical incline of the wire and 2g acceleration with a gross mass of 30 tonnes can break the posts in racking.

If the MHC is not able to use a spreader, then a spreader frame can be attached to the top of the container using lift-locks and the frame lifted using a lifting set (Figure 4).

Figure 4

Finally, the container can be lifted using slings attached to bottom corner fitting using lifting lugs and a transverse cross beam.

Figure 5 shows the angled bottom slings with an offset to compensate for an asymmetrically packed container. Bottom lifting creates a potential instability risk because the centre of gravity is higher than the lift point. Accidents may occur when the container base lands or catches on one side on a bollard or another container. Whenever possible lifting a packed flatrack using angled slings attached to the bottom corner fittings should be avoided.

Figure 5

Packed containers should never be lifted using angled slings attached to the top corner fittings as shown in Figure 6.

This practice is permitted for unpacked (empty) containers.

Figure 6

Containers built for the offshore industry have extra pad eyes (Figure 7) adjacent to the top corner fittings that allows them to be lifted using a lifting set.

Figure 7

Lifting Sets

Lifting sets can have chain or wire rope legs and ideally should comply with ISO 10855-2 and should be inspected in accordance with the Schedule of inspection and examination and test – Lifting Sets of ISO 10855-3.

Pre-use Checks

Always check the condition of all lifting accessories (from the hook downwards) before use. Do not rely on paperwork alone: the equipment may have been damaged since its last formal inspection. If in doubt investigate further before use.

Do not use damaged slings

Figure 8

Figure 9

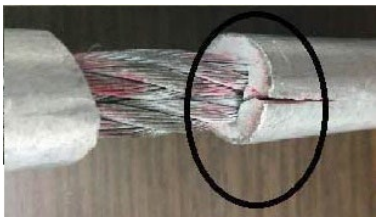

Figure 10

Slinging

- **Only use properly manufactured and tested equipment and connections; never use improvised equipment, knotted chains, spliced ropes, etc.**
- Know or find out the mass of the load.
- Check and operate within the load capacity of the lifting equipment, remembering that:
  - this is affected by the angle of the wire/chain between hook and its attachment point on the CTU
  - minimum breaking strength of a wire rope applies to new, unused, rope, and should be considered a straight line pull such that each rope end is fixed to prevent rotation
  - each fitting in the lifting assembly affects, and may reduce, the working load limit of the overall assembly
- Fit the sling or lifting set correctly to the container top corner fittings or spreader frame. The angle (θ) of the sling leg should never be less than 45° to the horizontal (Figure 11).

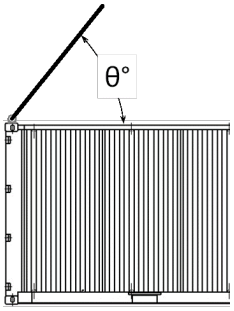

Figure 11

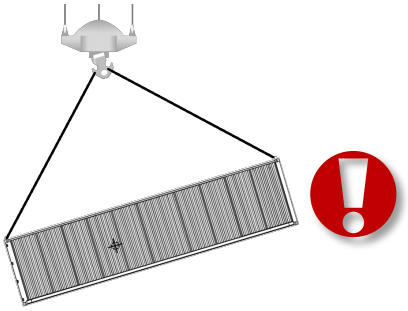

Figure 12

- Make a trial lift, keeping area clear and paying particular attention to the centre of gravity of the load and the hitch of the sling (Figure 12)
- Never crowd the hook. It is good practice to use a shackle when using two or more sling eyes on a hook. This allows the load to be centralized on the hook for full capacity
- Release the sling carefully – beware of snagging the load

Risk Assessment

- Review your terminal's risk assessment:
  - are all necessary control measures in the RA?
  - are all the control measures really applied in practice?
- Carry out your own field assessment of the risks for every task that you do

Communication

- Communication between the lifting appliance operator and others involved in the operation is essential, particularly if the operator has restricted view. Loads should not be lifted without someone having eyes on it and the ability to communicate with everyone in the area.

Empower your people to make good safety decisions

- Managers and supervisors should instruct and support their teams to challenge potentially unsafe conditions and practices. Team members should feel able to do so without negative repercussions.

If a lift does not go to plan

- If a lift does not go as planned (e.g. cargo shifts during the lift potentially shock loading slings) and there is risk of resulting damage, such as birdcaging (figure 13), to lifting appliances/accessories there should be a new inspection. This should include all potentially affected lifting appliances and/or accessories. There should also be a reviewed lifting plan which controls/addresses any previous plan failure.

Figure 13 (photo HSE)

Sample Further guidance

- Refer to locally applicable lifting regulations and/or consensus codes (e.g. BS codes)

- Guidance on Written Schemes of Examination for Lifting Equipment: Lifting Equipment Engineers' Association (LEEA): https://leeaint.com/downloads/download_doc.php?doc_hash=8b4ceeac418c835f4a1c48cafe70d713101f44b04c526a94d2763f2e82e3bb52

- IIL/5 & IIL/6: Safe Slinging – Risk Management (available to ICHCA and TT Club members): TT Club and ICHCA International: https://ichca.com/download/iil5-iil6

International Cargo Handling Coordination Association

Established in 1952, ICHCA International is an independent, not-for-profit organisation dedicated to improving the safety, productivity and efficiency of cargo handling and movement worldwide. ICHCA's privileged NGO status enables it to represent its members, and the cargo handling industry at large, in front of national and international agencies and regulatory bodies, while its Technical Panel provides best practice advice and develops publications on a wide range of practical cargo handling issues. Operating through a series of national and regional chapters, including ICHCA Australia, ICHCA Japan and Correspondence and Working Groups, ICHCA provides a focal point for informing, educating, lobbying and networking to improve knowledge and best practice across the cargo handling chain.

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Further Advice and Information

ICHCA International also offers a technical advisory service, with input from ICHCA Technical Panel, to answer member regulatory and operational cargo handling queries. For more information contact secretariat@ichca.com or visit www.ichca.com