

# **ICHCA International Limited**



INTERNATIONAL SAFETY PANEL

RESEARCH PAPER #11

## **LIFTING PERSONS AT WORK FOR CARGO HANDLING PURPOSES IN THE PORT INDUSTRY**

By

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This publication is one of a series developed by the International Safety Panel ("Safety Panel") of ICHCA International Limited ("ICHCA"). The series is designed to inform those involved in the cargo-handling field of various practical health and safety issues. ICHCA aims to encourage port safety, the reduction of accidents in port work and the protection of port workers' health.

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### **About the Author**

Helena Workneh comes from Chicago, Illinois and came to the UK on a one year internship with the Mountbatten Internship Programme. This initiative promotes educational and business links between the USA and the UK by providing the opportunity to gain practical and theoretical business experience, whilst also developing social and cultural awareness and understanding. Helena earned a Certificate in International Business Practice at the completion of her year of working with the TT Club. She holds a degree in Information Decision Sciences- a study that integrates business studies with information technology, statistics and operation management. Helena agreed to carry out the research and collation for this Research Paper in April 2005 and she completed the work with the help of various ISP members. She ended her year in London and returned to the United States in April 2006.





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## **LIFTING PEOPLE AT WORK FOR CARGO HANDLING PURPOSES IN THE PORT INDUSTRY**

### **1. INTRODUCTION**

- 1.1 This research was commissioned by the International Safety Panel (ISP) of ICHCA International Limited. ICHCA International is an independent, non-political international membership organisation, whose membership comprises corporations, individuals, academic institutions and other organisations involved in, or concerned with, international transport and the cargo handling industry. The ISP was established in 1991 and considers all aspects of safety and health in the handling of cargo and ancillary activities. It promotes, advises and informs those concerned with such issues accordingly and an important part of that activity is carrying out research. Research projects are reviewed or initiated when they are considered appropriate and relevant and they are reflected in the publication of papers in the Research Series of documents authorised by the Panel. This is the 11<sup>th</sup> in the series.
- 1.2 With the introduction of new techniques of packing and cargo-handling, it has become more and more necessary for people to work at height. Getting them up there, providing a safe platform to work from, and getting them down again safely is crucial. Traditional methods, such as portable ladders, are now recognised as unsafe over certain heights and increasingly mechanical means, such as hoists, are being used. Some of this equipment is primarily intended for cargo-handling rather than lifting people, which in turn gives rise to other safety considerations.
- 1.3 Following discussion at ISP, it was decided to commission a research initiative and TT Club agreed to manage the project and prepare a report for ISP. Currently, there is no known available research on the lifting of people for cargo handling purposes in ports and on the issues involved.
- 1.4 This research is intended to review the issues of concern and to highlight how legislators and the industry have responded to that need. This includes the legal position both internationally, regionally and in individual countries as well as current equipment and practices employed in the industry.

### **2. THE ISSUES**

- 2.1 Equipment that is designed to be used exclusively for the lifting of people is subject to a different, higher, set of standards than that designed exclusively for cargo. An example of the former is a passenger lift whereas the latter covers such items as cranes and gantries of all types, including fixed, tracked and mobile, derricks, cargo lifts, straddle carriers, hoists, lift trucks etc.
- 2.2 The traditional method of gaining access for work activities or to reach a place of work was the portable ladder but, as the heights needed to be accessed became larger and the locations varied, it became increasingly clear that such equipment was very limited and unsafe. There was a need for another approach.

- 2.3 One of the most commonly used lifting appliances throughout industry generally is the fork lift truck and many companies, including port cargo handling companies, developed cages and other devices that could safely carry people and be lifted by the truck. Such an arrangement, however, needs to be carefully controlled so as to be safe and is also limited in its scope and application and, as a result of a demand throughout industry generally, the multi-purpose mobile elevating work platform (MEWP) was developed. This concept was specifically designed to carry and lift people. Many different variations of this concept have evolved and within the port industry this type of equipment is widely used on shore.
- 2.4 However, there are situations in which such equipment cannot be deployed, especially on board a cargo ship, and these have necessitated the development of purpose designed equipment to be used with cargo lifting appliances and it is these situations that the research has concentrated on.

### 3. THE LAW

- 3.1 The law is intended to ensure that the working environment of all workers is safe and free from hazards that cause harm to their health or life. The situation, however, is often complicated by laws relating to the ship being different from the laws applying on shore. Whilst the flag state will have laws applying to the ship's responsibilities, the port state may have national laws that apply to all ships in its ports, whatever their flag and to shore workers who work on them. On shore, the situation may be complicated where there is a federal type of government when individual states/provinces may make their own laws.
- 3.2 However, all such laws should be based upon common international standards. Responsibility for establishing and updating international safety standards for cargo handling rests with the International Labour Organisation (ILO), based in Geneva, in Switzerland. Its conventions, from 1929 onwards, have formed the basis for national dock safety laws and the current standard is found in Convention 152 on Safety and Health in Dockwork. Adopted in 1979, it provides in Part II, Article 4 that national laws or regulations shall prescribe measures to:

- provide and maintain workplaces, equipment and methods of work that are safe and without risk of injury to health
- provide and maintain safe means of access to any workplace

In addition, Article 23 requires regular, periodic thorough examinations of all lifting appliances and loose lifting gear at intervals not exceeding 12 months

- 3.3 The ILO's complementary Code of Practice on Safety and Health in Ports says that lifting appliances should not lift people other than in a specifically designed personnel carrier (paragraph 5.2.1.1.10 on page 182).
- 3.4 As far as work equipment is concerned, a detailed example is shown by the regional European Directive on provision and use of all work equipment. All work equipment provided by an employer should be suitable for the conditions that it is to be used for, maintained in a safe condition so that the user's health and safety is

not at risk and inspected periodically by a competent person to confirm that it still is and continues to be safe for use. Risks produced by operating/using the equipment should be minimised or eliminated, where possible, by providing protection devices, marking and warning devices, personal protective equipment, instructions, training etc. It also requires that any mobile work equipment used for carrying people is suitable for that purpose.

- 3.5 The same directive also says that equipment for lifting people should have suitable devices to prevent workers from falling from it and also a reliable means of rescue should a person be trapped, in which case the person should not be exposed to any danger while awaiting rescue. The lifting/lowering of persons should not be carried out using equipment not designed for that purpose. Exceptions should only be made in circumstances where access cannot be safely gained by other means. Periodic examinations for equipment used to lift people should be done at least every six months, or more if a competent person finds it necessary.
- 3.6 Research has shown that there are various relevant national laws. In some instances, countries have made specific laws relating to terminal and ship cargo operations. In others, more general all-industry laws apply.

#### **4. THE SURVEY**

- 4.1 A comprehensive but simply stated questionnaire was created (see Appendix I). Due to the possibly sensitive nature of the information being requested, prospective respondents were made aware of the purpose of the questions and given over 60 days to complete and return the questionnaire.
- 4.2 The questionnaire was sent to a wide number of cargo handling facilities around the world. The responses were in sufficient numbers to consider the survey valid and, as data was collected from all five continents, they were sufficiently international in their spread. This is considered to be important because surveys are rarely completed by every single unit that receives the form, so this widespread response allows for an analysis that can be said to be truly representative.
- 4.3 The survey began with a set of questions of whether or not and how often the facility needed to lift people to certain heights. The questions were aimed at getting an idea of how widespread the need for such activity was, thereby illustrating the degree of relevance of the issue.
- 4.4 The next set of questions focused on what types of equipment were being used as a means of accessing different heights. The responses would give an insight into what was being practiced and, possibly, some feedback on which equipment worked better for which particular task.
- 4.5 Finally, the last question asked for details of local laws and their requirements in relation to lifting equipment and the activity of lifting people in the workplace.

#### **5. FINDINGS**

- 5.1 The way in which the questions were responded to varied from location

to location. As anticipated, some locations felt that it was confidential information and they chose to not disclose the name or location of the facility. Other responses were very detailed and gave complete feedback about their daily activity. Both were equally helpful and have enabled a comprehensive view of the issue to be compiled.

- 5.2 Looking at the data collected, it appears that a significant number of the facilities that do not require to reach heights are those located in the Middle East, and Southeast Asia. 50% in the Middle East and 25% in South East Asia reported no need for reaching heights. This compares with 12.5% of African and European respondents while were no such responses from the Americas.

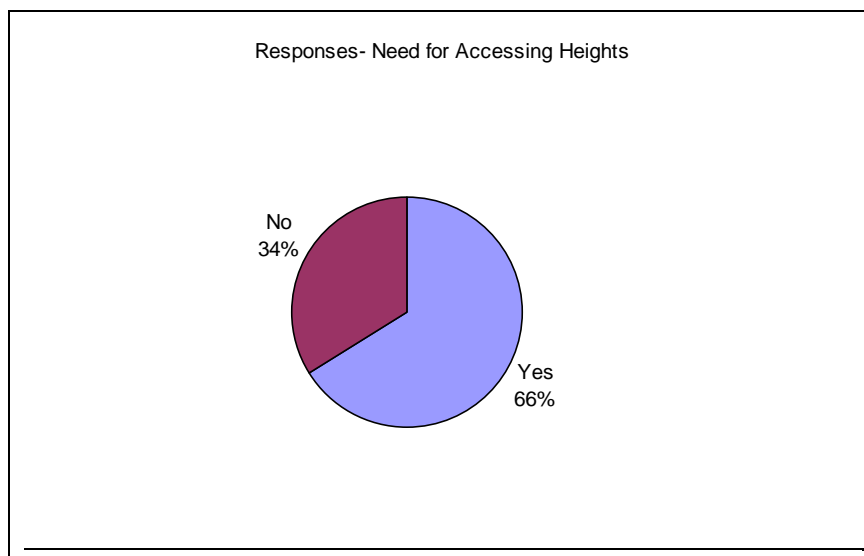


Figure 1

- 5.2.1 98% of those respondents who have a need for accessing heights said they used lifting equipment while 2% said that they use safety approved ladders for this purpose.
- 5.2.2 As the chart below shows (see figure 2), lifting of people is a major part of daily activities whether it is shoreside, ship board or warehouse activities.
- 5.2.3 85% of the respondents who do have a need, and who do allow for the lifting of people at their facilities do so with cargo lifting equipment whilst the 15% that replied otherwise described the methods they employ to do so.
- 5.2.4 For 49% of the respondents, the lifting of persons is a regular activity, and they have one or all of:
- detailed methods by which the lifting is done,

- special equipment for securing and fall protection,
- lifting appliances.

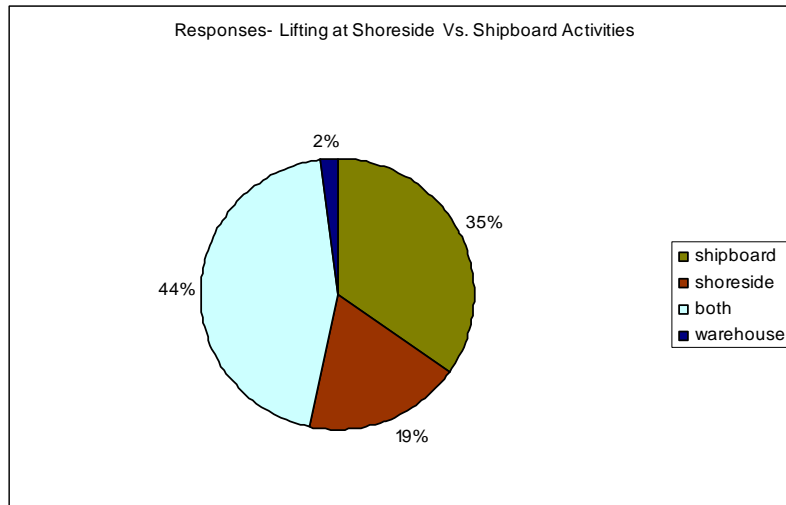


Figure 2

- 5.2.5 See Appendix III for a detailed summary of the responses received.
- 5.2.6 10% of the respondents said they have a need for lifting people by single hoist rope slewing cranes and gave descriptions of the precautions used in operating them. These responses showed no relation to the geographical location of the facilities,
- 5.2.7 See Appendix IV for a detailed summary of the responses received.
- 5.2.8 With regard to scheduled maintenance and checks, out of the entire population of respondents, only 7% reported not having a regular maintenance checks schedule. Regular checking of equipment as reported by the respondents varied according to local legal requirements. 28% have inspections before every use, 3% have weekly inspections, 8% do so every month, 11% every quarter, 17% every six months and another 11% check their equipment every year. The rest of the participants did not provide any details about the frequency of the safety inspection schedules
- 5.2.9 The replies to Q 10 on national laws are summarised in Appendix V. It will be seen that, whilst the majority do have either specific laws relating to port operations or wider-based national laws, 29% said that they did not have any laws at all.

## 6. OTHER RESEARCH

- 6.1 Accidents involving work at heights are a substantial cause of fatalities and injuries at the work place generally and this has resulted in the development of specific equipment for industrial use.
- 6.2 A common piece of equipment used on terminals is the mobile elevating work platform (MEWP) and, as with any item of work equipment, there are risks associated with its operation.
- 6.3 These risks have been addressed by one national labour inspectorate to ensure proper usage of the equipment. They are included here as they could have a wider interest. Accidents relate to the MEWPs collapsing, over turning, workers being thrown down from basket/cage, or the carrier being trapped against fixed structures.

6.3.1 The causes of these incidents were identified to as being be due to:

- equipment failure (due to failure of stability critical part or over reaching)
- ground conditions (uneven/soft ground)
- equipment being struck by vehicle
- over loading
- carrier struck by a load

6.3.2 Any risk of such incidents occurring has to be assessed by employers and/or others responsible for the use of the equipment so that precautions can be taken to eliminate or control the risks. In order to be able to control possible risks, the site and the operator of the equipment have to be checked for safety.

6.3.3 MEWP operators should:

- consider the use of a separate site for unrelated traffic such as deliveries
- ensure that there are no overhanging obstructions on transport routes
- ensure supervision makes sure systems of work are appropriate and being used accordingly
- establish limits for safe operation - for example, wind-speed
- ensure that there are procedures in place for loading/unloading during hours of other activities on site (such as delivery)

- ensure that drivers have been well trained (to use task specific equipment) before operation,
- ensure that routine checks are done according to manufacturer's instructions
- have a system for recording faults/repairs and maintenance
- check the make or model of any brought in equipment and its suitability for the planned task.

6.3.4 If significant risks remain after assessing and applying controlling measures, the use of fall protection systems is required. This can be achieved by using 'fall restraint', which stops a person from falling from the carrier in any way, or a 'fall arrest' system, which safely stops a person who has fallen out of the carrier. It is also common to use retractable lanyards to allow for maximum amount of freedom in movement combined with immediate restraint in the event of an impact. This may not be appropriate at times when work is being done near water because drowning is possible if the MEWP falls in the water. The fall arrest and fall restraint systems are not effective if MEWPs are over turned.

6.3.4.1 Therefore, certain points should be considered before applying these systems:

- Could the impact of the arrest cause other occupants or loose materials to be forced out of the carrier?
- Is there a fixture that the falling person might strike before the system goes into effect?
- Is there a plan to rescue workers who have fallen and find themselves suspended in their safety harness and, if so, has it been tested and practiced?

6.3.5 The national legal requirements in that country in relation to access to work at height state that every existing place of work or means of access or egress at height shall:

- be stable and of sufficient strength and rigidity for the purpose for which it is intended to be or is being used
- where applicable, rest on a stable, sufficiently strong surface
- be of sufficient dimensions to permit the safe passage of persons and the safe use of any plant or materials required to be used and provide a safe working area having regard to the work to be carried out there
- possess suitable and sufficient means for preventing a fall;



- possess a surface which has no gap
  - through which a person could fall
  - through which any material or object could fall and injure a person
  - which could give rise to other risk of injury to any person, unless measures have been taken to protect persons against such risk
- be so constructed and used, and maintained in such condition, as to prevent, so far as is reasonably practicable
  - the risk of slipping or tripping
  - any person being caught between it and any adjacent structure
  - where it has moving parts, be prevented by appropriate devices from moving inadvertently during work at height.

## **7. CONCLUSIONS**

7.1 Certain conclusions can be drawn from this research.

- 7.1.1 It is clear that for many ports and terminals, there is a regular and ever present need to provide means of access to, and work places at, heights for cargo handling purposes
- 7.1.2 It is also clear that for the vast majority this means utilising cargo lifting equipment
- 7.1.3 This need applies to both shoreside operations and ship operations, with the latter predominating.
- 7.1.4 Various methods and special equipment have been adopted by many of the respondents.
- 7.1.5 10% of the respondents need to lift people by single hoist rope slewing cranes and have developed specific precautions to ensure that this operation is safe.
- 7.1.6 The answers on regular maintenance and checks/inspection reveal a rather mixed picture. 7% said that they did not do any such checks at all and, whilst the other 93% said that they did, the frequency varied quite considerably.
- 7.1.7 The law, based on the international standards of the ILO, recognises the need and requires certain specific measures to be taken to ensure the safety of workers

## **8. RECOMMENDATIONS**

- 8.1 Whether or not there is a specific legal requirement to do so, any work activity that requires lifting persons for cargo handling purposes should be risk assessed and appropriate methods and equipment provided that will conform to the conclusions of that assessment.
- 8.2 All such equipment should be subject to a regular regime of inspection and checks.
  - 8.2.1 All lifting equipment should be thoroughly examined at intervals of no greater than 12 months in accordance with ILO Convention 152.
  - 8.2.2 In some areas, this is required to be reduced to every 6 months for equipment used to lift people.
  - 8.2.3 Every item of lifting equipment should be inspected before use.
- 8.3 As there appears to be a wide gap between what can be seen to be needed and advice available on how that need can be met, it is concluded that the cargo handling industry might benefit from a simple good practice guide on lifting people for cargo handling purposes.
- 8.4 Some local laws may prohibit the lifting of persons by single hoist rope lifting devices. Such laws should always be checked before planning to use such devices for these purposes.

## **9. ACKNOWLEDGEMENTS**

In preparing this report, assistance from many individuals was welcomed and appreciated over the past months. The TT Club and ICHCA international's ISP would like to thank those who submitted ideas, added to the subject matter and expanded on the issues concerned. In addition, a special thanks to all the participants in our survey - thank you for your time and consideration in completing the survey and getting it back to us in time for the analysis.

## 10. BIBLIOGRAPHY

1. [www.londonhazardcentre.org.uk](http://www.londonhazardcentre.org.uk). Fact Sheet- Lifting Operations and Lifting Equipment Regulations. 2001.
2. [www.hse.gov.uk](http://www.hse.gov.uk). Simple guide to the Provision and Use of Work Equipment Regulations. 1998.
3. <http://www.uclan.ac.uk>. A Guide to the Safe Use of Lifting Equipment, Lifting Operations and Lifting Equipment Regulations. 1998.
4. [www.hse.gov.uk](http://www.hse.gov.uk). Health and Safety Executive-The Work at Height Regulations 2005. Statutory Instrument 2005 No. 735.
5. [www.hse.gov.uk](http://www.hse.gov.uk). HSE Information Sheet MISC 614. Preventing Falls from Boom-Type Mobile Elevating Work Platforms. 2003.
6. Barnes, RWS, MIOSH, FNI. International Safety Panel Briefing Pamphlet No.8- "Safe Working on Container Ships".
7. Alexander, J., Compton, M. International Cargo Handling Co-ordination Association Research Paper No.4. Container Top Safety-Lashing and Other Related Matters. London, May 1999.
8. ILO Convention 152 Safety and Health in Dockwork, ILO, Geneva 1979
9. ILO Code of Practice Safety and Health in Ports, ILO, Geneva 2005 ISBN 92-2-115287-1

## Appendix I

### Questionnaire

***This survey is part of a research project being carried out by the TT Club in collaboration with ICHCA International's International Safety Panel. It is concerned with the work activities of shore based workers and not ships crew.***

1. Does your facility have the need to provide access for workers to reach heights as part of cargo handling work activities? (If no, please go to question #10)

Yes No

2. Does this involve gaining such access by the use of lifting equipment?

Yes No

3. Does this involve shoreside activities/shipboard activities? \*

\*delete as necessary

4. Does this include the use of cargo lifting appliances?

Yes No

5. Is this regular or occasional activity?

6. What methods/special equipment /appliances are used to lift workers at your facility (please select all that apply)

METHODS:

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---

---

SPECIAL

EQUIPMENT: \_\_\_\_\_

---

---

LIFTING

APPLIANCES: \_\_\_\_\_

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7. Does your terminal need to lift people by single hoist rope slewing cranes?

Yes No

8. If Yes, please explain how this is done and what precautions are taken for protection of the workers using it.

9. Do you have a regular inspection/examination regime?

Yes No

If so, how often is it planned to take place?

10. Does your national law refer to the lifting of people by port equipment? If yes, what does it require?

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If the answer to #1 is "no", please still answer #10 and complete and sign this form and send it to the address shown below. Negative answers are just as significant as positive ones.

Name: \_\_\_\_\_

Position: \_\_\_\_\_

Company: \_\_\_\_\_

Address1: \_\_\_\_\_

Address2: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Email: \_\_\_\_\_

**Thank you for your time in filling in this questionnaire. Please return form to:  
riskmanagement@ttclub.com**

## Appendix II

### List of respondents

Aamir Haroon	Chris Kapp
Adrian Marques Lluch	Chris Langford
Alwyn Mendonca	Chris Steibelt
Andrew Synnott	Craig Kappe
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Arcan Fayatorbay	Deepak Amin
Art Merrick	Eleftherios Kouzapas
Barry McColl	Eric Luca
Bernard Wong	Ewn Robinson
Bjorn Svanholm	Flavio Iannuzzelli
Caporale Fabrice	Geoff Cunningham
Capt. P. Ponambalum	Gonzalo Santillana C.
Carlos Cuesta Rodriguez	Graham Proud
Chan Hing Shing	Ivo Verheyen
Charles Donald Tan	J.M. Mac Donald
Chiong Y E/ Paul Kristandi	Jan Kielmann
Chris English	John Chiang
Kraft	Raymond Makzume
Jose Medina Montes	Ruel Lagtapon
Joseph Fernandes	Ryszard J. Karger
Ken Cahill	Sameeh Abdullatif
Ken Sully	Savas Islek
Levent Adali	Shimon Lior
Marc Belmans	Simon Bejjani
Mehmet Oguz TOP	Simon Heywood
Neil McInnes	
Keith Hamilton	Sivasankar Kushal
Oliver A. Gepia	Steve Nott
Paul Fardy	Steve Wade
Peter Bengtsson	Sunil Kurup
Peter Sladack	Sven Polhammer
Philippos Tsangaris	Thomas Perry
Prajit Bhaskaran	Valeriy Klimenko
Preethilal Fernando	
Rajesh George	

### Appendix III

#### Responses - Methods, Special Equipment and Lifting Appliances

<b>What Methods:/special equipment /appliances are used to lift workers at your facility (please select all that apply), Methods:/SPECIAL EQUIPMENT/LIFTING APPLIANCES</b>
<b>Methods:</b> Personal cages. <b>Special Equipment:</b> Harnesses, inertia reels. <b>Lifting Appliances:</b> Portainer cranes.
<b>Methods:</b> Work boxes, quay crane cages, quay crane spreaders. <b>Special Equipment:</b> Inertia reels and self retracting lanyards are used for work outside of the cage/workbox. Other item of personnel attachment PPE also utilised. Quay cranes and ships cranes (manual and semi auto spreaders).
<b>Special Equipment:</b> Cherry picker boom lift.
<b>Methods:</b> Elevated work platforms, work cages (container) and work boxes. <b>Special Equipment:</b> Harnesses, inertia reels, rope grabs, karabiners, horizontal safety lines, vertical safety lines, ISO corner fixing posts. <b>Lifting appliances:</b> Modified plate clamp.
<b>Methods:</b> Cherry Picker.
<b>Methods:</b> Shore cranes (single and double hoist wire)/gantry cranes equipped with safety cages/safety flats, forklifts equipped with workbox. <b>Special Equipment:</b> Safety flats/ forklift attachable workboxes. <b>Lifting Appliances:</b> Container spreaders equipped with a safety cage.
<b>Methods:</b> Lifting with cages for personnel, lifting with safety-flats. <b>Special Equipment:</b> Safety-flat, platform on spreaders/head-blocks of container crane cages to use with fork-lifts, cages to use with slewing cranes. <b>Lifting Appliances:</b> Container cranes, jib cranes, forklifts, mobile harbour cranes. Ship's gear is forbidden to lift persons.
<b>Methods:</b> Gantry crane picks up the worker from the dock and takes him aloft on top of the container stacks above 5 high to unlock the containers from above. Containers 5 higher and lower are unlocked from below and there is no need to go aloft. <b>Special Equipment:</b> Unlocking poles to unlock the containers from on top of the containers, plus a gearbox to anchor to while the men are unlocking to prevent a fall. The men must wear safety vests and be tied to the gearbox before they begin to work over the side of the containers. <b>Lifting Appliances:</b> The men are lifted on top of the containers by use of the gantry crane container spreader which has a safety cage for the men to be safely lifted on top of the containers.

<p><b>Methods:</b> Using shore side or shipboard cranes, personnel are hoisted in man-baskets into the hold of bulk vessels. These personnel disconnect the slings from material handling equipment that is then placed into the hold. Excess personnel are then hoisted out of the hold and the material handling equipment is employed to clear the normal access ladder routes.</p> <p><b>Special Equipment:</b> Man basket/cage.</p> <p><b>Lifting Appliances:</b> Bridle with master oblong link and four legs.</p>
<p><b>Methods:</b> Container gantry crane spreader beams are equipped with protected man cages that allow persons to be safely lifted aloft. In addition, some terminals have special purpose cages that can be picked up and lifted directly with the container spreader beam. Historically these are known as "Metro Cages".</p> <p><b>Special Equipment:</b> Fall protection harnesses are used and personnel are to "clip in" to anchor points within the lifting cage. Once on top they are to clip on to an anchor point either on the spreader beam, a special purpose heavy tie off box placed on top of the container stack called a "cone basket".</p> <p><b>Lifting Appliances:</b> Container spreader beams.</p>
<p><b>Methods:</b> Shore side container crane beam to lift men onto containers aboard vessels; man-lift basket connecting to forklift blades dockside.</p> <p><b>Special Equipment:</b> Container crane beam personnel basket; personnel fall arrest harness/system; man-lift basket.</p> <p><b>Lifting Appliances:</b> Container beam; man-lift basket.</p>
<p><b>Lifting Appliances:</b> Man basket attached to a forklift.</p>
<p><b>Methods:</b> By ladder and by the use of the gantry's crane spreader where a special cage has been constructed/installed.</p>
<p><b>Methods:</b> Platforms are used which are hired by third parties.</p> <p><b>Special Equipment:</b> Platforms.</p> <p><b>Lifting Appliances:</b> Forklifts and platforms.</p>
<p><b>Methods:</b> Stevedores are lifted by ship's crane.</p> <p><b>Special Equipment:</b> Iron made cage for stevedores' transportation.</p> <p><b>Lifting Appliances:</b> See special equipment.</p>
<p><b>Methods:</b> Forklifts with pallets to lift longshoremen to unlock containers after they have been placed on beds.</p>
<p><b>Methods:</b> (i). Regular activity: by use of the crane spreader (ii). Occasional activity: Arrange the stevedoring labourers to get into the men-cage or 20' men-cage container and then the men-cage or the 20' men-cage container is lifted by means of lifting appliances to the container top of a container stack. The labourers inside the men-cage or 20' men-cage container are safe upon handling by the lifting appliances.</p> <p><b>Special Equipment:</b> Crane spreader, men-cage and 20' men-cage container.</p> <p><b>Lifting appliances:</b> Shore crane, rubber-tyred gantry crane, top loader or a small forklift truck.</p>



<p><b>Methods:</b> Motor boat.</p> <p><b>Lifting Appliances:</b> Forklift.</p>
<p><b>Methods:</b> Use of spreader on the quay crane. The spreader is equipped with a cage and handrails for safety purpose.</p>
<p><b>Lifting Appliances:</b> MHS.</p>
<p><b>Special Equipment:</b> Lasher wears full fall protection equipment of harness, with lanyard attached of self-retracting lifeline (reel). Lifting appliances: safety box on four terminals and spreader alone on one terminal.</p>
<p><b>Methods:</b> Men to be lifted enter man-cage on spreader and attach themselves to spreader.</p> <p><b>Special Equipment:</b> Harness &amp; fall restraint unit.</p> <p><b>Lifting Appliances:</b> Portainer gantry crane.</p>
<p><b>Methods:</b> Access stairways (safety approved).</p>
<p><b>Methods:</b> Climbing on pallets which are fitted through reach trucks up to 10 feet.</p> <p><b>Lifting appliances:</b> Reach trucks.</p>
<p><b>Methods:</b> Elevator.</p> <p><b>Special Equipment:</b> Cage.</p> <p><b>Lifting appliances:</b> Crane.</p>
<p><b>Special Equipment:</b> Forklift with man cage, use of cherry picker, quay crane via spreader.</p>
<p><b>Special equipment:</b> Man cages, ladders, forklifts.</p>
<p><b>Methods:</b> Workers are harnessed into a safety cage which is locked to and lifted up by the telescopic boom of the Manitou pay loader.</p> <p><b>Special equipment:</b> safety full body harness; safety cage; Manitou pay loader with telescopic boom.</p>
<p><b>Methods:</b> Its done with a cage specially made for this type of lifting work which is secured to the masts on the forklift by chains.</p> <p><b>Special Equipment:</b> a metal cage specially made for our type of lifting work.</p> <p><b>Lifting Appliances:</b> forklift.</p>
<p><b>Methods:</b> Max 2 persons in the special designed frame on top of the spreader of which one communicates with the crane driver. Method is approved, always without payload, persons can only enter or leave spreader on a rigid surface (ground, container, and hatch) never from a "hanging" spreader. Maintenance frames, we have several types of maintenance frames designed for cleaning windows, changing runners, replacing lights, etc. Rescue frame, designed for rescue operations in a 20' hold as most severe scenario.</p> <p><b>Special Equipment:</b> Container top safety frame used for collecting conventional twistlocks, method is one or two lashers and one for communication, the frame is</p>

picked up by the spreader of the crane and double secured. The frame is moved forwards just above the containers so the twistlocks can be picked up. Lashing gondola, used for unlocking twistlocks in the 4th row and higher, method 1 lasher on each layer were twistlocks has to be unlocked (max 3 row simultaneously) and one for communications. Container spreader used for lifting persons on top of containers or hatch.
<b>Methods:</b> The appliances are not at our facility but rather supplied by the vessels as per #5 above.
<b>Methods:</b> Safety cages are attached to cranes and placed on stacks; staff are attached to safety cage by means of fall arrest/restraint equipment. <b>Special Equipment:</b> Safety cages. <b>Lifting Appliances:</b> Gantry cranes, mobile cranes, ships cranes.
<b>Methods:</b> For shipboard activities (lashing/unlashing), the people are lifted over shore crane spreader, inside a security cage. For shoreside activities in a special machine to lift people. <b>Special Equipment:</b> Harness, security line. <b>Lifting Appliances:</b> Shipboard activities: Security cage over the shore crane spreader as part of same spreader structure (see photos) Shoreside activities: specific machine to lift people (see photos).
<b>Methods:</b> We are using the spreaders of STS gantry cranes; they have a small platform protected with hand rails. The spreader (with the longshoremen on board) is being positioned on top of a tier of containers. The longshoremen work on containers being secured by fall arrest gears.
<b>Methods:</b> To & from container ships: by a closed gondola container (like a cage which is connected to the gantry. For maintenance of lighting columns in the operational area in the Israeli ports we use the mobile cranes which are designated for personal lifting (enclosed basket at the edge of the crane boom) <b>Special Equipment:</b> An integral safety cage which is mounted on the head block of the spreader of the gantry crane. <b>Lifting Appliances:</b> A mobile enclosed cage which can be connected to a slewing crane. We use generally - double jib cranes for general cargo handling.
<b>Methods:</b> Stevedores are lifted onto container stacks to unlock twist locks. <b>Lifting Appliances:</b> An area on each crane spreader is used to lift personnel.
<b>Methods:</b> A special designed 20 OT; guarded property <b>Lifting Appliances:</b> HMC.
<b>Special Equipment:</b> safety guarded place on gantry cranes spreader. <b>Lifting Appliances:</b> Gantry crane
<b>Methods:</b> (i) A specially designed cage is lifted by forklift truck; the staff member stands inside the cage. (ii) Movable steps. <b>Special Equipment:</b> (i) The specially designed cage has been made by MFC it has four sides with a small access gate. The four sides are at least waist height

and are sturdy. The cage was designed to be lifted by a forklift/reach truck. (ii) The steps are designed to move when pulled and are fitted with a brake to be used when they are in position. Hand rails are also fitted. <b>Lifting Appliances:</b> (i) A fork lift/reach truck is used. (ii) N/A
<b>Methods:</b> We do not require our people to be lifted, as most of the cargoes that are on the racks are handled through our forklifts. If, anytime we require to handle by lifting people then proper care will be taken.
<b>Methods:</b> Fall arrest gear that is attached to a certified lifting point on the spreader of the crane. The longshore personnel tie off to the crane and then ride in the man basket on the spreader to the area they have to work. <b>Special Equipment:</b> Fall arrest gear, gantry crane spreader bar. <b>Lifting appliances:</b> Gantry crane spreader bar.
<b>Special Equipment:</b> Eddie gear, the Wand, safety harnesses. <b>Lifting Appliances:</b> Forklift with man cages, cranes with man cages.
<b>Methods:</b> Man lift or forklift with safety basket. <b>Special Equipment:</b> Man lift.
<b>Methods:</b> Man basket/forklift attachment.
<b>Methods:</b> Lift by use of forklift, occasional use of gantry crane, mobile crane. <b>Special Equipment:</b> special lifting cages, man baskets. <b>Lifting Appliances:</b> Gantry spreader with man cage built in.
<b>Special Equipment:</b> Safety guarded place over gantry crane spreader. <b>Lifting Appliances:</b> Gantry crane.

## Appendix IV

### Responses – Precautions taken for use of single hoist rope slewing cranes

Does your terminal need to lift people by single hoist rope slewing cranes?	If Yes, please explain how this is done and what precautions are taken for protection of the workers using it.
Yes	All employees are harnessed and attached to certified anchor points while inside the workbox/cage. The workbox is secured by 4 chains and hammerlocks at each corner of the workbox. Work cages are secured to the crane spreader (auto or manual) via the twist lock housing and two secondary safety attachments (chains and hammerlocks). The crane is operated by a driver who has met the company and regulatory standard of competency. All crane operations are under the direction of a competent crane deck foreman. All points of work aboard the vessel are made aware of cage work and to take precautions in regard to any vessel heel.
No, could be possible though on older vessels	
Yes	Use is only permitted if normal entrance is unsafe or unavailable. Use is only permitted for gaining access/exit from one level to another. Number of persons lifted in one time is limited, Safety wire is attached if only one point of attachment to the crane hook, Self closing door opening inwards, Cage has to be closed or safety belts/harness has to be worn, Safety factor of slinging gear is 16:1, No synthetic gear allowed, Max 1/2 capacity of the cranes SWL can be used when lifting people.
Yes	Totally closed cage or workers need to wear fall arrest systems, reduced hoisting speed (max 20m/min), and command post always manned during this operation, max. allowed passengers must be indicated
Yes	The master oblong link of the man basket bridle is placed on the crane hook or shackled to the swivel component. A 1/2" 6x19 Fibre Core Wire Rope with eyes swedged on each end is used as a separate safety wire and is installed to separately secure the basket against accidental separation. A test lift is completed on the basket before it is hoisted.

Yes	By using a safety belt and an iron made cage, always by means of ship's crane.
Yes	The cage is completely safe to lift people- employed as an elevator using ship's crane.
No	No, the company does the inspection as per their norms
Yes	The port uses crane with lifting baskets to lift their staff for their day to day operations.
No	With regard to the lifting of the worker to lash/unlash the containers on board no precautions are taken for protection.

## Appendix V

### Responses – Local legislation regarding lifting people

<b>Does your national law refer to the lifting of people by port equipment? If yes, what does it require?</b>
There are a series of National Standards that must be complied with by any organisation using equipment to work at heights. Some states have specific requirements which amongst other things define what is working at heights. For the waterfront in one State, the authorities have defined it as above one container high.
Vessel work subject to Marine Orders- Part 32 and various State based Legislation. The basic premise behind all the State based legislative bodies is to ensure formal inspections, risk assessments and procedures are in the place to support competent trained employees. Formal inspections are required to guarantee the integrity of the equipment used. All equipment is required to meet a minimum standard and be supported by secondary safety systems.
The Workplace Health and Safety Regulation (1997), parts 18 and 19, clearly gives directives regarding working at height and methods of lifting persons and equipment to the required heights. No port specific equipment is utilised, at this port for this type of activity.
Certified lifting equipment, certified trained personnel, height regulations.
Not specific to the maritime industry, however there are a series of national Standards that must be complied with by any organisation using equipment to work at heights.
It is allowed when risk assessment shows that risk is acceptable and alternatives are not available. Precautions are taken against falls and getting caught between objects. Regular inspections covering gear used the lifting of people. Nobody can be obliged to use above mentioned equipment. Legislation on this subject is spread over several articles of our national laws, European regulations and guidelines and is subject to interpretation by different parties involved.
See Directive 89 / 655 / EEC Charged by 95 / 63 / EEC: measures to prevent falling of cage, measures to prevent falling out of cage, measures to prevent crushing of worker in cage, SWL of crane must be halved, means of communication must be at disposal.
Yes, the men must wear a safety harness while going aloft and it requires a safety cage on the beam for the men to ride up in. Once on top of the containers the men must secure themselves to a device to prevent a fall while they work over the edge of the containers to be unlocked. We have the men secure to a flatrack container designed to be secured to and prevent a fall from on top of the containers.

29 CFR_1917.45 (j), 29CFR_1918.66 (c).
Federal OSHA has regulations at 29 Code of Federal Regulations 1917.45(j). These regulations allow lifting by a container crane spreader beam, a bosun's chair, and a platform. Platforms must have rails, be designed with a safety factor of 4 have a plate indicating maximum load rating, be equipped with self closing gates with a locking device, have a protection if exposed to falling hazards, special attachment requirements, power up and down, provisions to prevent accidental boom movement, prohibition of crane trolleying, inspection requirements, and rules for operators. Bosun chairs must be rigged to prevent accidental disengagement. Spreader beam personnel platforms must have railings, openings with a means of closure, a plate denoting maximum rated load, devices to prevent doors from opening accidentally, and specific means attachment.
Meet the standards of the following: Fed OSHA 29 CFR 1917.45(j); Cal OSHA, Subchapter 7, Group 13, Article 98. Also Labour Code Section 142.3 and Pacific Coast Marine Safety Code (PCMSC) rule 1509.
National Labour code, part II Section 12.10.
No.
No.
Not to our knowledge.
When people working at height, there should be a provision of one well constructed working platform equipped with guardrails, toe-board and means of access. The definition of working at height is more than or equals to 2 metres. Our said special equipments are all equipped with proper guardrails, means of access, etc.
No reference made.
No reference made.
No.
National Law does not specify working at heights at port terminals. The terminals are however required to provide a safe working environment for its employees. Lifting of people to heights is not required in day to day port activities as these are being carried out by port equipment. The most common work activity at heights is the gantry operation and the method of operator reaching the work bridge is by steel gangway. There are other areas that stevedore gangs may work on top of containers as signalmen etc and the access to these is done by way of ladders.
No.

Not allowed/Not applicable
Our national law does not refer to the lifting of people by port equipment.
Unaware of any national law.
Law relates to lifting any person above 3 metres, not specifically port related. Any person operating/being lifted over 3 metres must be secured by fall restraint equipment.
I am certain it would, but cannot be definitive as we are not directly involved.
Not to our knowledge.
The Port does not allow lifting of people by port equipment.
Couldn't obtain this information. The company does not run or manage any terminal in any port in the country.
No.
No.
No.
No.
That the proper safety procedures are followed and that the safety of the persons using the equipment and carrying out the work is taken care of and looked after.
The national law knows a "working cage" for working at heights. The container spreader including the people frame on top is equalized with the working cage. The only exception is the wind force where it is allowed to work. In case of a working cage it is limited to 6 Beaufort, for the container spreader it is limited to the crane limits (8 Beaufort).
No.
There are laws and regulations which the vessel operators have to abide by and these are stipulated in the vessel's International Safety Management Certificate which in turn is approved/endorsed by the flag state under which the vessel is registered.
Port equipment may not be used for lifting of people!
No.
I don't know.



There is a general regulation for devices used to lift people, not specific for port equipment.
No.
Only for workers lifting by forklift. The maximum weight and size of the cage, its construction, its periodical checks. Placarding, the authorization of the forklift operator.
No.
No knowledge.
No national law in this respect.
No.
We are not aware of any law referring to this subject however in the port the stevedores/ port labourers are seen using lifting equipment to gain access.
Yes, as per the standard rules and safety regulations of the Port Authorities and Local Municipality Office. A proper cage kind of equipment to be used that passes all quality and safety standards.
Not that I am aware of. Suggest we take legal advice about local maritime law.
Yes, the law states that the lifting operation should be carried out with outmost precaution. The lifting equipment should be of high standards and should have proper insurance coverage.
Yes, it requires the proper use of fall arrest gear that is attached to a certified lifting point in accordance with national rules pertaining to the container industry.