



SHIPS LIFTING PLANT



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Table of Contents

1. WHAT IS SHIPS LIFTING PLANT?	3
2. WHAT ARE THE PROBLEMS WITH SHIPS LIFTING PLANT?	3
3. HOW IS SHIPS LIFTING PLANT KEPT IN A SAFE CONDITION?	4
4. WHAT IS THE LEGAL POSITION?	4
5. DUTIES	6
6. RECORDS	6
7. PRACTICAL GUIDANCE FOR CARGO HANDLERS	7
APPENDIX 1 - DEFINITIONS	8
APPENDIX 2 - RECORDS REQUIRED FOR SHIPS LIFTING GEAR IN ILO 152	8
BIBLIOGRAPHY	9
ABOUT THE AUTHORS	12
INTERNATIONAL CARGO HANDLING COORDINATION ASSOCIATION	12
DISCLAIMER	12
FURTHER ADVICE AND INFORMATION	13

Warning

This document provides an introduction to Ships Lifting Plant. For detailed advice it is necessary to read this in conjunction with relevant national and international legislation.

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SHIPS LIFTING PLANT

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1. | WHAT IS SHIPS LIFTING PLANT?

Ships lifting plant comprises mechanical lifting appliances and lifting gear carried on board ship and used for the discharge and loading of cargo or ship's stores or equipment.

Lifting appliances include:

- Derricks
- Jib cranes
- Derrick cranes
- Transporter or gantry cranes
- Fork lift trucks and mobile cranes carried by the ship
- Cargo lifts

Stern ramps, side ramps, front ramps and internal ships ramps are classed as access equipment and are not used as lifting appliances but lifting appliances are used to place and restow them. Therefore this type of access equipment is subject to the same requirements as for lifting appliances.

Ships lifting gear includes:

- Slings: wire rope, chain, fibre (man-made and natural)
- Lifting chains
- Lifting frames
- Spreaders
- Any other gear which is provided by the ship and used to connect the load to the lifting appliance

See Appendix 1 for definitions of lifting plant, dock work and the ships covered by the provisions.

2. | WHAT ARE THE PROBLEMS WITH SHIPS LIFTING PLANT?

Many ports in the world still rely upon ships lifting plant to load and discharge cargo and port personnel should check whether the lifting plant is safe to use before operations commence (see Item 5).

The use of unsuitable or unsafe ships lifting plant for cargo handling has resulted in the death or injury of port workers. The kind of problems found extend from lack of lubrication of the plant to situations where plant is clearly damaged or otherwise unfit or unsafe to use. This pamphlet is intended to give general advice and guidance to those who are responsible for providing and those who use shipborne cargo handling lifting plant for loading/discharge purposes.

3. | HOW IS SHIPS LIFTING PLANT KEPT IN A SAFE CONDITION?

Controls on ships lifting plant are laid down in Convention 152 of the International Labour Office (ILO 152). This was adopted in 1979. Appendix 1 explains which ship types are covered by the Convention. Appendix 3 lists those port/flag states that have ratified ILO 152 and Appendix 4 lists those port/flag states that ratified the earlier ILO 32.

This Convention deals with health and safety in dock work and specifies that each item of ships lifting plant must be:

- tested when new, or after repair or modification, to ensure that its lifting capacity has not been affected and then shall be given a thorough examination,
- given a thorough examination at least once in every 12 months (see Appendix 2 for explanation of thorough examination).

In addition, every lifting appliance on board ship must be tested once in every five years.

The thorough examinations and testing must be carried out by a person competent to do so and this normally means a person employed by:

- a classification society.
- a competent shore-based contractor.

Shipborne personnel may also carry out some of this work if competent but it needs time, equipment and expertise to do so. A thorough examination includes stripping down blocks, for example, and testing requires special equipment.

International Labour Office (ILO) Convention 32, which was adopted by ILO in 1932, was subsequently replaced by ILO 152. ILO 152 has a higher standard than ILO 32, the main differences relating to ships lifting plant being -

- the previous system of a thorough examination of ships derricks every four years (the quadrennial or quad) together with an annual inspection, has been replaced by the requirement for an annual thorough examination,
- regular testing of lifting appliances is now required.

4. | WHAT IS THE LEGAL POSITION?

The legal situation is complex.

ILO Convention No 152 has “advisory” status internationally. This means that each maritime nation has to ratify (i.e. sign) the Convention and then incorporate it in its own national laws for the Convention to have legal effect in that country. Appendix 3 lists those countries that have ratified ILO 152 and Appendix 4 lists those countries that ratified ILO 32.

Many other nations are working towards reflecting the higher standards of ILO 152. Some nations may not be able to ratify the Convention. For example, Governments based on a federal structure cannot sign on behalf of their individual states. However, they normally seek to follow the provisions of such Conventions.

Such countries include Australia – which has adopted the standards of ILO 152 (Marine Orders, Part 32), Canada – which is about to adopt new Tackle Regulations that will have the same effect, and the USA – which has adopted a new Terminal Standard (CFR 1917) and revised Safety and Health Regulations for Longshoring (CFR 1918).

This leads to a possible nine different legal positions concerning the provision and use of ships lifting plant for cargo operations that might apply in a given country's ports.

A ship calling at a foreign port and intending to provide safe lifting plant could find:

- The Merchant Shipping law governing the port state in question fully incorporates ILO 152 and requires all ships, of whatever flag state, to comply with the standards of ILO 152 when loading/discharging cargo in that country's ports. The port state may or may not have ratified ILO. The flag state may or may not have so ratified either.

or

- The port state has fully incorporated ILO 152 into its Merchant Shipping laws, but foreign flag ships are allowed to reflect the standard of their own flag when in the port state's ports. The port state's own flag ships would be required to follow the port state's national law.

or

- The foreign flag state has adopted ILO 152 and, therefore, observes that standard irrespective of the port of call.

or

- The foreign flag state has adopted the earlier ILO 32 but has not yet adopted the higher standards of ILO 152.

or

- The foreign flag state has adopted neither ILO 32 nor ILO 152.

A ship calling at a foreign port where the local stevedores will use the ship's lifting plant for cargo handling purposes could find:

- The port state has incorporated ILO 152 into its workplace safety laws and requires examination of the ships' documents and inspection of the ships lifting plant before use.

or

- The port state has incorporated ILO 32 into its workplace safety laws which also require examination of the ships' documents and inspection of the ships lifting plant before use.

or

- A few port states have adopted more stringent requirements than ILO 32 or ILO 152 regarding ships lifting plant being used in its own ports.

or

- The port state does not have any specific shoreside safety law concerning ships lifting plant.

5. | DUTIES

The basic duties of the ship's owner and master are to ensure -

- that the ships lifting plant is safe after being installed, it is maintained in a safe condition, all the necessary examinations and tests are carried out at the correct intervals and examinations and tests are properly recorded.
- Where ships' crew use the ships lifting plant, they should do so in a safe manner.

The duty of the shore-based employer whose personnel will use the ships lifting plant for loading or discharge is to check that the ships lifting plant documents are in order and visually check (as far as is possible) that the plant is safe to use. This is usually carried out by an experienced member of the employer's staff who is in charge of the loading/discharging operation.

The shore-based employer and his employees must operate the lifting plant in a safe manner.

6. | RECORDS

Both ILO 32 and 152 require the ship to keep records of every item of ships lifting plant and the various tests and examinations on board.

ILO 32 detailed particular forms to be used, whereas ILO 152 has adopted a slightly different approach, with the details needing to be recorded being specified but the manner of recording them left flexible. See Appendix 5 for the documentary requirements of ILO 152.

The records under ILO 32 normally consist of a ships gear register which has different parts for the lifting plant detail, the tests, the thorough examinations and the annual inspections. To assist in the standardisation of procedures, the ILO adopted model documents that could be used.

In each case individual test and thorough examination certificates should be kept with any other relevant documents and be available for inspection.

Proper planning should ensure against a test or thorough examination running out while the ship is at sea. If this does happen a postponement of the test or thorough examination may be agreed with the appropriate authority. However, whilst some nations accept postponements, many others do not. Both ship's management and stevedore should be aware of the shoreside law of the port state regarding postponements. If acceptable within

the law, postponements should only be for a short period of time and authorised by a classification society or surveyor of the maritime administration of the flag state.

7. | PRACTICAL GUIDANCE FOR CARGO HANDLERS

In addition to examining the test and certification documents/records, cargo handlers must physically check the actual ships lifting plant that is to be used and that it is properly identified by the documentation.

This will only need to be done for the lifting plant to be driven and/or used for loading or discharge of cargo/stores/equipment. If the crane at No 1 hatch is to be used but not the others, that will be the only lifting appliance that needs to be examined.

Cargo lifts are classified as ships lifting plant and may be operated either by shoreside or ships personnel.

Cargo lifts should be treated as ships lifting plant before being used, whether on their own or with other cargo handling equipment or vehicles.

The extent of examination of the ships lifting plant will depend upon the age and apparent condition of the ship, its plant and the regularity of handling in the port. In some circumstances a simple check will be enough. On the other hand, there will be situations in which a more extensive examination should be made.

The condition of the ships lifting plant to be used should be checked as far as is reasonable. Where appropriate, this should include the rigging of derricks (checking with the ships' rigging plans) and derrick cranes. A stevedore would not normally examine the topping gear (or span gear), except where attached to the deck or winches, unless there was a particular reason for doing so.

The publications listed in the bibliography provide detailed advice on examination of derricks, cranes, hooks, shackles, wires, blocks, splices, wire rope grips and other deck and access equipment (including marking).

If an unacceptable condition is found, e.g. "Liverpool" splices on running gear, or damaged wires, the stevedore must insist on it being replaced before that particular item of lifting plant issued.

Ships masters operating ships on regular routes will be familiar with the requirement of the port states at which the ship calls. The documentation and ship lifting plant checks should not therefore take time nor delay cargo work provided the ships lifting gear is in good order.

Where, however, the ship does not have lifting plant which fully complies with the requirements, both the record check and plant examination could take an extended time.

Should there be a difference of opinion, e.g. as to whether a particular splice was acceptable or not, independent advice from either a surveyor from the local maritime administration, inspector from the shoreside enforcement agency, or person from a competent shore based contractor or classification society should be sought.

If a stevedore has any reason to believe that a particular lifting appliance should not be used, they should report this to an appropriate person such as a supervisor. In such circumstances operations management may consider options including but not limited to:

- hire-in another lifting appliance, either shoreside or floating crane,
- change method of discharge,
- insist on new thorough examination or test (as appropriate) being carried out.

APPENDIX 1 - Definitions

DOCKWORK

All and any part of the work of loading or unloading any ship as well as any work incidental to it – the definition of such work to be established by national law or practice.

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 PLANT

Consists of all lifting appliances and loose gear.

LOOSE GEAR

Any gear by means of which a load can be attached to a lifting appliance, but which does not form an integral part of the appliance or load.

SHIP

The term “ship” covers any kind of ship, vessel, barge, lighter or hovercraft excluding ships of war. However, the Convention provides that member Governments may exempt dock work in relation to small ships if the work is irregular and in relation to fishing vessels providing that safe working conditions are maintained, and that the competent authority is satisfied that it is reasonable to do so.

THOROUGH EXAMINATION

A detailed visual examination by a competent person, supplemented, if necessary, by other suitable means or measures, in order to arrive at a reliable conclusion as to the safety of the appliance or item of loose gear examined.

APPENDIX 2 - Records required for ships lifting gear in ILO 152

A register of the lifting appliances and items of loose gear shall be kept in a form prescribed by the competent authority, account being taken of the model recommended by the International Labour Office. The register shall comprise certificates granted or recognised as valid by the competent authority, or certified true copies of the certificates, in a form

prescribed by the competent authority, account being taken of the models recommended by the International Labour Office in respect of the testing, thorough examination and inspection, as the case may be, of lifting appliances and items of loose gear.

BIBLIOGRAPHY

ILO Convention No 32 ILO Convention No 152

ILO Code of Practice "Safety and Health in Ports" 2005

- Chapter 4 lifting appliances and loose gear
- Chapter 5 Safe use of lifting appliances and loose gear.

Obtainable from: ILO Publications, International Labour Office, CH-1211 Geneva 22, Switzerland.

PMA/ILWU Safety Code (as amended)

Obtainable from: Pacific Maritime Association, Sacramento Street Tower, 550 California Street, San Francisco, California 94104, USA.

ISO3078 Shipbuilding – Cargo winches

ISO 1660 Cranes - Safe Means of Access

ISO 2308 Hooks for lifting freight containers up to 30 tonnes capacity – Basic requirements

ISO 2415 Shackles

ISO 3874 Series 1 Freight Containers – Handling and Securing. This includes lifting ISO containers without spreaders

ISO 4301 Crane Classification ISO 4308 Wire Ropes

ISO 4310 Testing Cranes

ISO 4390 Examination of Wire Ropes

ISO 6043 Ship building and marine structures – Eye and fork assemblies under tension load – Main dimensions

ISO 6044 Ship building and marine structures – Derrick boom head fittings –Main dimensions

ISO 6045 Ship building and marine structures – Bearings for derrick goosenecks-assemblies and components

ISO 8087 Mobile Cranes-Winch and Drum Sizes

ISO 8148	Shipbuilding and marine structures – Derrick boom head fittings – Fixed type
ISO 8314	Shipbuilding and marine structures – Trunnion pieces for span bearings and lead block bearings
ISO 8793	Spliced Eyes
ISO 9926	Training of Crane Drivers ISO 10245 Limit Switches
ISO 12480	Part1: Guidance on the Safe Use of Cranes ISO 15513 Competence of Crane Drivers

The following regulations have been drawn up for use in the European Economic Community and are included for reference. Please consult your own Standard Authority for their equivalents.

EN 292	Part 2: Safety of Machinery
EN 1050	Safety of Machines-Principles of Risk Assessment EN 1677, Part 1: Components for Slings - Forged Steel. Grade 8 Part 2: Hooks with Latches-Grade 8 Part 3: Self Locking Hooks-Grade 8 Part 4: Links-Grade 8 Part 5: Hooks with Latches-Grade 4 Part 6: Links-Grade 4
EN 12385	Part: Steel Wire Ropes, General Requirements Part 2: Definitions Part 3: Use and Maintenance Part 4. Stranded Ropes for General Lifting
EN 13411	Part 1: Terminations for Steel Wire Ropes, Thimbles Part 2: Splicing of Eyes for Slings Part 3; Ferrules and Ferrule Secured Eyes Part 4: Resin and Metal Socketing Part 5; “U” Bolt, Wire Rope Grips. Part 6: Asymmetric Wedge Socket
EN 13414	Part 1: Steel Wire Rope Slings Part 2: Safety, Selection and Discard Part 3: Grommets and Cable Laid Slings
EN 13889	Forged Steel Shackles Dee & Bow- Grade 6

The following regulations have been drawn up for use in the United Kingdom and are included for reference. Please consult your own Standards Authority for their equivalents.

BSMA 17	Specification for Derrick Boom Clamps
BSMA 20	Specification for the Presentation of Ships Cargo Gear Particulars
BSMA 28	Dimensions of Tracks for Masts and Deck Fittings
BSMA 31	Specification for Ships Deck Machinery – Cargo Winches BSMA 47 Code of Practice for Ships Cargo Blocks
BSMA 48	Code of Practice for the Design of Ships Derrick Rigs BSMA 79 Specification for Jib Cranes Ship Mounted
BSMA 81	Specification for Ships Derrick Fittings
BS 320	Part 3: Zinc Coated Wire Ropes for Ships Part 5: Wire Rope for hauling Part 7: Large Diameter Wire Rope Part 8: Higher Breaking Wire Rope
BS 463	Part 1; Specification for Sockets for Wire Rope. Imperial measurements Part 2: Specification for Sockets for Wire Rope. Metric measurements
ISO 2415	(DC01/711555) Forged Shackles Dee & Bow (BS 3032) BS 3551 Alloy Shackles
BS 4018	Specification of Blocks for wire rope max. 25t in combination BS 4344 Pulley Blocks for Fibre Rope
BS 4536	Pulley Blocks for Wire Rope
BS 5744	Code of Practice for the Safe Use of Cranes BS 7121, Part 1: Safe Use of Cranes - General Part 2: Code of Practice for the Inspection, Testing and Examination Part 3: Mobile Cranes Part 4: Lorry Mounted Cranes Part 5: Tower Cranes Part 11: Offshore Cranes Part 12: Recovery Vehicles and Equipment BS 7167 Bordeaux Connections
Maritime and Coastguard Agency: Code of Safe Working Practice for Merchant Seaman.	

About The Authors

Tom Sims was an apprentice through to Chief Officer on general cargo trades world- wide with Prince Line from 1949 to 1960. He then became Stevedoring Superintendent with A E Smith Coggings Ltd, Stevedores from 1960 to 1976 responsible for ship management, loading and discharging all cargoes. From 1968 he was Equipment Superintendent responsible for all mechanical and lifting equipment for the Group in London and Tilbury. He became Marine Equipment co-ordinator for Coubro & Scrutton Ltd from 1976 to 1994 dealing with Port Operators, Stevedores and Shipowners on Cranes, Derricks, Lifting Equipment, Container Securing and Ro-Ro Lashing. Since 1994, he has offered a consultancy service on lifting and securing equipment, the designing of lifting equipment and implementation of ISO Standards, EU Standards and Regulations. He is a Foreign Going Master and a chains and ship's cargo gear tester and examiner. He assisted in developing chapters 4&5 of the third edition of the ILO Code of Practice on Health and Safety in Ports and was the technical consultant in developing PSO pocket cards on safe slinging.

Subsequent editions have been reviewed by members of the ICHCA Technical Panel.

International Cargo Handling Coordination Association

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