
Regulation IO – 11.0: Lifting Equipment Protocol

1. Purpose
2. Scope
3. References
4. Definition
 - 4.1. Load
 - 4.2. Lifting Equipment
 - 4.3. Lifting Appliances
 - 4.4. Lifting Accessories or Loose Gear
 - 4.5. Competent persons
 - 4.6. Inspection
 - 4.7. Periodic Inspection
 - 4.8. Thorough Inspection
 - 4.9. Working Load Limit (WLL)
 - 4.10. Safe Working Limit (SWL)
 - 4.11. Proof Load Test
 - 4.12. Acronyms
5. Requirements for Lifting Operation
 - 5.1. General Requirements
 - 5.2. Crane on hire
 - 5.3. Crane for hire for contract lifting operations
 - 5.4. Strength and Stability
 - 5.5. Positioning and Installation
 - 5.6. Requirements of Lifting Accessories



Regulation IO – 11.0: Lifting Equipment Protocol

- 5.7. Lifting Equipment for Lifting Persons
 - 5.8. Marking of Lifting Equipment
 - 5.9. Color Coding
 - 5.10. Thorough Examination and Inspection
 - 5.11. Educational Background and Qualifications:
 - 5.12. Training
 - 5.13. Reports and Defects
 - 5.14. Use & Maintenance
 - 5.15. Third Party Inspection Bodies
 - 5.16. Sanctions & Penalties
- 6. Record Keeping
 - 7. ANNEX 1
Lifting Equipment Frequencies for Testing / Inspection

EHS Lifting Equipment Protocol

1.0 Purpose

To provide guidance for Dubai World Business units & its Clients engaging in activities which involve Lifting Operations at Warehouses, Manufacturing floors, Construction Sites, To & From Vessels, Repair Yards, Workshops .etc. The Management of Lifting activities has been identified as a high risk operation, which requires uniform set of requirements for proper Planning and Execution. Unplanned & Unsafe Lifting operations can result in catastrophic outcomes involving multiple fatalities and serious injuries as well as extensive damage to properties and facilities. This Protocol highlights the important factors that have to be considered while proposing a systematic approach towards planning a Lift. This also outlines the Roles and Responsibilities of the personnel involved in a Lifting operation.

2.0 Scope

This Protocol shall apply to all Lifting Equipment and Accessories used at sites within PCFC/DW jurisdiction. It is the responsibility of Dubai World Business Units & its Clients, Contractors and any



Regulation IO – 11.0: Lifting Equipment Protocol

other users working within PCFC/DW jurisdiction to ensure that all requirements stipulated in this protocol are fully complied with during any Lifting operations.

Exclusions:

- Requirements for rope access: This information can be found in IRATA regulations for Industrial Rope Access Systems: Specification, Selection, Use and Maintenance.
- Requirements for escape lines.
- Merchant Navy Vessel, Marine ropes, anchors etc.,

3.0 References

- Trakhees Regulations
- Lifting Equipment is subject to the Lifting Operations and Lifting Equipment Regulations (LOLER) 1998
- Lifting Equipment is also subject to the Provision and Use of Work Equipment Regulations (PUWER) 1998
- Federal Law No(8) of 1980 –UAE’s Labour Law
- DM- "Code of Construction Safety Practice"
- DAC-Req-06 issued by Dubai Accreditation Centre
- Local Order 61/1991, on Environment protection regulation in the Emirate of Dubai.
- DM Technical Guidelines 41 pursuant to Local Order 61/ 1991, “Examination and certification of crane, hoists, lifts and other lifting appliances”.
- ISO/ IEC 17020:1998 General criteria for the operation of various types of inspection bodies.

4.0 Definition

4.1 Load

Means any material, person, animals (or any combination of these) that are lifted by the lifting equipment. In some circumstances, the weight of the lifting accessories including the hook block may be considered as part of the load being lifted.

4.2 Lifting Equipment



Regulation IO – 11.0: Lifting Equipment Protocol

Means any lifting machine, driven by manual or mechanical power, or other means that is able to raise, lower or suspend loads, and includes any accessories used in connection with that machine, but excludes continuous mechanical handling devices (i.e. conveyors), such as but not limited to:

- Cranes (tower, mobile etc),
- Wall / Pillar Cranes, Derricks, Swing Jibs and Davits,
- Runway Beams, Monorails, All Pad Eyes, Gin Poles and Gin Wheels,
- Winches, Hoists (air and electric), Crabs, Telfer Hoists,
- Chain Blocks, Wire Rope Pulling Machines, Pull Lifts, Trolleys,
- Powered working Platforms,
- Elevators and Lifts,
- Forklifts, Self-Loader and Side Booms,
- Lifting Jacks (pneumatic or hydraulic).

4.3 Lifting Accessories or Loose Gear

Means any item used to attach the load to the lifting equipment but which is not in itself a part of the load or the equipment, such as:

- Chains and Wire Ropes,
- Chain, Wire Rope and Webbing Slings,
- Rings, Links, Hooks, Shackles, Eye Bolts, Swivels, Blocks, Snatch Blocks,
- Beam Clamps and Plate Clamps,
- Lifting Beams / Spreader Beams.

4.4 Competent persons

The Competent personnel carrying out a Thorough Examination must be deemed competent by virtue of attaining the appropriate theoretical and practical knowledge, together with experience that will enable them to detect defects or weaknesses in the equipment. This will be a combination of experience; training and qualifications. The competent personnel must be “independent and impartial”. This does not prevent someone working for the same organization



Regulation IO – 11.0: Lifting Equipment Protocol

being the competent person but they should not be someone who is responsible for production/operation/profit. The competent personnel must have minimum 3 years of hands-on experience within a relevant engineering discipline related to lifting equipment and appropriate knowledge of the relevant laws, local & admin orders, codes of practice and inspection techniques.

4.5 Trained person

All persons to be engaged in lifting operations, shall be sent for trainings through 3rd party on Safe Lifting, Rigging and Slings methods.

Regular Safety Inductions, Safety talks or Trainings shall be carried out to all staff involved, in regards but not limited to Hazards and Risk associated with the operations.

4.6 Substantial / Major Alteration

A measure whereby the equipment undergoes a change to either the quantum of its load lifting capacity, or changes to its function or methods of controlling those functions.

The following shall be considered “Substantial / Major alterations” or any other measure not specifically detailed that affects the safe use of the equipment:

- Increase of the safe working load or an increase in performance,
- Increase of the rated speeds,
- Increase of the reach (outreach, lifting height, etc),
- Alteration to safety devices,
- Alteration to load carrying parts (e.g. anchorages, spelter sockets, primary structures etc),
- Alteration to driving mechanisms and controls,
- Repair or alteration that affects strength and / or stability,
- Alteration of kind of current or voltage,
- Alteration of kind of guiding rails,
- Alteration of kind of number of landing doors.

4.7 Inspection



Regulation IO – 11.0: Lifting Equipment Protocol

Any physical activity, related to ensuring that an item of “Lifting Equipment”, in its entirety and at a given location or environment, meets the specified design and operating Standards and is safe to operate or utilize for a specified period. This includes, but is not limited to, activities such as measuring, testing, and recording, checking, analysing, loading and charting one or more characteristics of the equipment.

4.8 Periodic Inspection

The minimum, specified period, denoted in days, weeks, months or years, between one “Inspection” and a repeat or next “Inspection” as per **Annex 1**.

This means an inspection based on the working environment, the frequency and severity of use of the lifting equipment and in no circumstances shall the inspection interval exceed 12 months. The inspections shall include all items specified by the manufacturer for annual inspection together with all routine inspection items.

If the manufacturer’s recommendations are not available a competent person must specify, in writing, all the items/components to be inspected together with the acceptance/rejection criteria, which must be applied by the Inspector.

NOTE 1: The 12 month inspection period is based on a normal working day of up to 8 hrs and a 5/6-day working week (2400 hours). When usage of the lifting equipment exceeds these figures a competent person must specify exactly, in writing, what the period of these inspections is.

NOTE 2: As the result of a periodic inspection, a competent person may recommend a major inspection.

4.9 Thorough Inspection

It means the following items shall be checked for compliance with manufacturers’ specifications and safe operation, as a minimum:

- Oil levels, fuel level and lubrication.
- Ropes, rope terminal fittings and anchorages, rope drums and sheaves for any damage and wear.
- All water is drained from air reservoirs.



Regulation IO – 11.0: Lifting Equipment Protocol

- Crane for any loose or damaged structural component including supports and outriggers where fitted. Loose joints may be readily noticed by flaking or marking on the paint surface or by rust marks. Similarly, cracks may often be detected by rust runs.
- Security of the counterweight. Where this is in the form of removable weights, checking that the weights correspond to those shown on the counterweight chart for the operating condition in use.
- Load moment system where fitted is correctly set or fitted (or both) with the program appropriate to the boom or jib length, and fly-jib lengths and falls or parts of rope.
- Indicator appropriate to the boom, jib or fly-jib length is fitted.
- Crane cabin is in a tidy condition and free from grease and oil, rags, tools and materials other than those for which storage provision is made.
- Pneumatic systems and hydraulic systems including their safety devices.
- Operation of the crane through all motions with particular attention to brakes.
- Operation of all limit switches or cut-outs and safety devices. Caution to be exercised in making the checks in the event of non-operation.

4.10 Working Load Limit (WLL)

Means the maximum load (mass), which any piece of lifting equipment may lift safely in the most efficient configuration. For wire rope, chain and fibre rope slings this is in direct lift i.e. eye to eye in a straight vertical line.

4.11 Safe Working Limit (SWL)

Means the maximum load (mass), which any piece of lifting equipment may lift safely in a particular configuration, other than its most efficient configuration. e.g. for a wire rope sling choked on a square load without any corner protection its safe working load is approximately 50% of its WLL.

4.12 Proof Load Test

The application of a predetermined load excess of SWL to assess the ability of the equipment to withstand operation requirements. This applied proof load shall never exceed the elastic limit of the item being tested.



Regulation IO – 11.0: Lifting Equipment Protocol

The amount of Proof Load to be applied will vary depending upon the type of equipment, its SWL, and the applicable Standard. On completion of any proof load test, the “Lifting Equipment” is to be fully inspected to ensure that the structural integrity of the equipment has not been impaired.

4.13 Testing and Certification

All Lifting equipment, Accessories and supporting structures should be overload tested before first use, major alteration and periodically (As per ANNEX 1). In some circumstances, it might be necessary to treat the supporting structures as separate entities (eg. where a structure supports more than one crane).

When the testing and subsequent thorough examination has been completed, the competent person should issue a report of thorough examination which should include details of the tests. Test Certificate shall be issued, if the equipment is SAFE FOR USE and no significant issues found during inspection.

Testing and Certification of Lifting Equipment and Accessories shall be obtained through 3rd party Inspection body approved by authority in respective scope.

4.14 Acronyms

PCFC	Ports, Customs & Free zone Corporation
DW	Dubai world
DM	Dubai Municipality
BU s	Dubai World Business Units
SWL	Safe Working Load
WLL	Working Load Limit

5.0 Procedure for Lifting Operation

5.1 General Requirements

Lifting equipment is so constructed or adapted as to be suitable for the purpose for which it is used or provided, and to have regard to the working conditions and risks to health and safety in the place in which that work equipment is to be used. The risk assessment must be carried out



Regulation IO – 11.0: Lifting Equipment Protocol

as per the requirements of Ministerial Order No(32) of 1982 regarding “The Determination Of Retentive Methods And Measures For The Protection Of Workers From The Risks Work” and Trakhees Regulations. The risk assessment will need to include:

- How often the lifting equipment will be used
- Where the lifting equipment will be used
- The nature and characteristics of the load that the lifting equipment will lift
- Any limitations on use specified by the manufacturer or supplier
- It must cover means of access, ergonomic risks, weather conditions in open-air operations, etc.
- Every lifting operation involving lifting equipment shall be
 - properly planned as Lifting Plan and this is to be done by a competent person
 - appropriately supervised
 - carried out in a safe manner –

look out for:

- Suspended loads – where are people working? - If the load fell?
- The continuing integrity of equipment
- The attaching and detaching of loads
- Proximity hazards
- Pre-use check
- DO NOT overload
- Be aware of causes of over-turning and ensure this does not happen.
- Visibility – ensure we can see what is happening
- **All lifting operations are ‘risk assessed’ Safe Working Load - SWL’s – must NOT be exceeded**
- The status of all equipment to be known by all people using it and all who may be affected by it. The status is to be clearly identified
- All checks are to be done by a *competent person*
- Only trained people allowed in areas where lifting equipment is used



Regulation IO – 11.0: Lifting Equipment Protocol

- The equipment in use is only to be made of material suitable for the conditions under which it is to be used.
- All fixing points and mountings are to be of adequate strength and capability
- Environmental aspects needs to be taken into consideration e.g. when out of doors, high winds
- Equipment that has been stored needs checking prior to use

5.2 Crane on hire

The crane hire company has a duty to ensure that when a mobile crane is hired out, physical evidence accompanies it (e.g. a copy of the last examination report issued by Approved agency), and the user should ensure that this evidence is available. The user should ensure that the crane is thoroughly examined by a competent person before it is put into use, to make sure it is safe to operate.

The user has the duty to manage the subsequent lifting operations in a safe manner. The user (as an employer or a self- employed person) also has the duty to ensure that periodic thorough examinations are undertaken at the frequencies laid down in this protocol. The user may well come to an arrangement with the hirer under which the hirer carries out the thorough examinations, but that does not alter the user's duty to make sure they are done.

It is the responsibility of client to ensure that the Mobile Crane hired (temporary or contract) from 3rd party service providers, for operations within their facility, have necessary pass issued from the authority.

5.3 Crane for hire for contract lifting operations

This refers to the situation where an organization enters into a contract with a third party who will undertake the lifting operation on their behalf, i.e. the third party provides the crane and the operator. In these circumstances the crane owner has the duty to ensure that the crane is properly maintained, examined and has valid test certificate and safe to use and that the lifting operation is carried out safely.



Regulation IO – 11.0: Lifting Equipment Protocol

5.4 Strength and Stability

- Lifting equipment is of adequate strength and stability for each load, having regard in particular to the stress induced at its mounting or fixing point.
- Every part of a load and anything attached to it and used in lifting it is of adequate strength.
- Account should be taken of the combination of forces to which the lifting equipment will be subjected as well as the weight of any associated accessories used in the lifting operation. A competent person should ensure that the strength and stability of the lifting equipment continues to be adequate for the tasks that the equipment is intended to be used for.
- Where appropriate suitable effective measures to provide sufficient resistance to overturning must be taken in order to ensure the adequate stability of the lifting equipment. Where there is a significant risk of overturning and/or overloading arising from the use of the equipment it should be provided where appropriate with equipment or devices such as rated capacity indicators and rated capacity limiters. Such devices provide audible and/or visual warning when the safe lifting limits are being approached.

5.5 Positioning and Installation

Lifting equipment should be positioned or installed in such a way as to reduce to as low as is reasonably practicable the risk of the lifting equipment or a load striking a person; or from a load drifting, falling freely or being released unintentionally.

It should be ensured that there are suitable devices to prevent a person from falling down a shaft or hoist way.

5.6 Requirements of Lifting Accessories

The main requirements relating to lifting accessories are as follows:

- They are of good construction, sound material, and adequate strength and free from patent defects.
- The safe working load (SWL) must be displayed or, for lifting accessories, plainly marked on it; only items listed or marked may be used in a lifting operation.



Regulation IO – 11.0: Lifting Equipment Protocol

- The safe working load must NEVER be exceeded.
- Before being taken into service all items must be tested and thoroughly examined by a competent person, and at six-monthly intervals during service.
- Certificates must be issued for all items.
- Wrought iron equipment must be periodically annealed (i.e. subjected to heat treatment which enables the wrought iron to revert to its "safer" crystal structure).
- Registers must be kept giving details of equipment.

5.7 Lifting Equipment for Lifting Persons

Lifting equipment for lifting persons used at DW/PCFC site is designed:

- To prevent a person using it being crushed, trapped or struck or falling from the carrier.
- To prevent so far as is reasonably practicable a person using it, while carrying out activities from the carrier, being crushed, trapped or struck or falling from the carrier.
- With suitable devices to prevent the risk of a carrier falling.
- So that a person trapped in any carrier is not thereby exposed to danger and can be freed.

The raising and lowering of people by work equipment, which is not specifically designed for the purposes, should only be undertaken in exceptional circumstances, when it is not practicable to gain access by less hazardous means. Where it is necessary to use such work equipment then all necessary precautions must be taken to ensure safety, including appropriate supervision.

Examples of lifting machinery which is not specifically designed for lifting people but which could be used if the necessary precautions are taken include a fork- lift truck, a telescopic handler and a crane (fixed or mobile). When fitted with a suitably designed carrier or working platform, these can provide a safer alternative to other means of access (such as a ladder). However, such an arrangement will not provide the same level of safety as purpose- built equipment such as a mobile elevated work platform (MEWP).

5.8 Marking of Lifting Equipment



Regulation IO – 11.0: Lifting Equipment Protocol

- Machinery and accessories for lifting loads are clearly marked to indicate their safe working loads.
- Where the safe working load of machinery for lifting loads depends on its configuration then the machinery is clearly marked to indicate its safe working load for each configuration; or
- Information, which clearly indicates its safe working load for each configuration, is kept with the machinery.
- Accessories for lifting are also marked in such a way that it is possible to identify the characteristics necessary for their safe use.
- Lifting equipment, which is designed for lifting persons, is appropriately and clearly marked to this effect.

5.9 Colour Coding

It is mandatory to ensure all portable, circulating and fixed lifting equipment are colour coded to give visual indication of its certification status.

The following **colour code cycle** must be used to indicate the current lifting accessories in use , such as: Chains and Wire Ropes, Webbing Slings, Hooks, Shackles, Eye Bolts, Swivels, Blocks, Snatch Blocks, Beam Clamps and Plate Clamps, Lifting Beams / Spreader Beams etc.,

Colour Code	Month (6 months interval)	Year
White	Jan to Jun	2017, 2019, 2021
Blue	Jul to Dec	2017, 2019, 2021
Orange	Jan to Jun	2016, 2018, 2020
Green	Jul to Dec	2016, 2018, 2020

5.10 Thorough Examination and Inspection

BUs and Contractors & users must ensure that lifting equipment is thoroughly examined after installation and prior to service. Also it must be ensured that lifting equipment, which is exposed to conditions causing deterioration, which is liable to result in dangerous situations, is



Regulation IO – 11.0: Lifting Equipment Protocol

Thoroughly examined –

- In the case of lifting equipment for lifting persons or an accessory for lifting, at least every 6 months
- In the case of other lifting equipment, at least every 12 months; or
- In either case, in accordance with an examination scheme (Annex 1); and
- Each time that exceptional circumstances which are liable to jeopardize the safety of the lifting equipment have occurred; and
- If appropriate for the purpose, is inspected by a **competent person** at suitable intervals between thorough examinations.

5.11 Educational Background and Qualifications:

The competent personnel carrying out a thorough examination has appropriate practical and theoretical knowledge and experience of the lifting equipment to be thoroughly examined to detect defects or weaknesses and to assess their importance in relation to the safety and continued use of the lifting equipment.

The competent person must have minimum 3 years of hands-on experience within a relevant engineering discipline related to lifting equipment and appropriate knowledge of the relevant laws, local & admin orders, codes of practice and inspection techniques. Nobody is allowed to perform inspection independently without having appropriate qualification and training.

5.12 Authorized Persons

Only Authorized person with valid Driving License in respective category, issued by Local Authority shall be allowed to operate the Lifting equipment like Forklift/Mobile Crane.

All persons who use lifting equipment must have received adequate competency training from 3rd party, for purposes of health and safety, including training in Load Charts and the Lifting methods, which may be adopted when using the lifting equipment, any risk which such use may entail and precautions to be taken.

Any person who supervises or manages the use of lifting equipment and operations must have received adequate training for purposes of health and safety, including training in the methods



Regulation IO – 11.0: Lifting Equipment Protocol

which may be adopted when using the work equipment, any risks which such use may entail and precautions to be taken.

5.13 Reports and Defects

A person making a thorough examination for an organization must: :

1. Notify the organization of any defect in the lifting equipment which in his opinion is or could become a danger to persons.
2. As soon as is practicable make a report of the thorough examination in writing authenticated by him to the organization and any person from whom the lifting equipment has been hired or leased.
3. Owner/User of lifting equipment who has been notified of defects must ensure that the lifting equipment is not used before the defect is rectified.

5.14 Use & Maintenance

This regulation deals with the Maintenance of lifting equipment. In addition to the pre-operational checks to be conducted by the operator before the commencement of the work, a system of regular maintenance by competent persons must be in existence and records kept and logged. They should be operated within defined safe operating limits, e.g. the maximum lift height and capacity. Equipment should be properly maintained according to manufacturers' instructions on inspection, maintenance and servicing. In addition to these checks, which should be carried out by a competent person on a routine basis, the operator should carry out a daily safety check.

A record of all checks and repairs carried out should be retained.

5.15 Third Party Inspection Bodies

Third party inspection bodies must have valid accreditation from Dubai Municipality –DAC/ Central Lab for testing and inspecting Lifting Equipment. The inspection bodies should be approved by EHS to operate within Dubai world/ PCFC jurisdiction.



Regulation IO – 11.0: Lifting Equipment Protocol

The Inspection Body must have a management system, which includes but not limited to the following:

Proper Documentation of its policies, procedures and operations starting from receiving the request for an inspection, carrying out contract review, preparing for inspection, performing inspections, recording results and up to the issuance of the final report/ certificate in accordance with the documentation requirements of ISO/ IEC 17020:1998 “General criteria for the operation of various types of bodies performing inspections” and any additional requirements set by the relevant authorities.

5.16 Sanctions & Penalties

As part of their role as an enforcement authority EHS will identify any activities where there are significant risks to the workers/public that have not been adequately controlled by the user and issue “Sanctions (administrative/legal/operational)” as determined by the EHS and /or Penalties as laid down in the EHS Tariff.

6.0 Record Keeping

BUs, Contractors, Owner/ Users of the lifting equipment must ensure that the information contained in every report made to them is kept available for inspection:

- In the case of a thorough examination of lifting equipment other than an accessory for lifting, until they ceases to use the equipment.
- In the case of a thorough examination of an accessory for lifting, for two years after the report.
- Any EC conformity declaration received must be kept for as long as the equipment is operated.
- The initial declaration must be kept until the equipment is disposed of.
- Reports of thorough examinations and inspections should be kept available for inspection at the place where the lifting equipment is being used. If this is not possible, the information should be readily accessible.
- Reports must be readily available to the EHS officer if required.
- No lifting equipment should leave any undertaking unless accompanied by physical evidence that the last thorough examination has been carried out and color coded as per this protocol.



Regulation IO – 11.0: Lifting Equipment Protocol

ANNEX 1

Lifting Equipment Frequencies for Testing / Inspection & Certification

Lifting Equipment Type		Frequency For	
		Proof Load Test	Inspection (SWL)
1	All Lifting Accessories: Chains and wire ropes Rings, links, hooks, shackles, eyebolts, swivels, blocks, snatch blocks Beam and plate clamps, frames, pallets, lifting beams and cargo nets	On initial supply After substantial alteration or Major repair At discretion of surveyor	Every six (6) months
2	Lifting Equipment: Pedestal cranes, mobile cranes, forklifts, tower cranes Overhead travelling cranes, wall / pillar cranes, derricks Winches, hoist (air and electric), crabs, Telfer hoist, powered working Platforms, vehicle lifts or hoists etc. Mobile or movable jacks and associated "Lifting Equipment" <i>Lifting Persons & Suspended Baskets *</i>	On initial supply Every four (4) years After reinstallation, substantial alteration or major repair At discretion of surveyor	Every twelve (12) months <i>Every (6)Months* Six</i>
3	Runaway beams, pad eyes, gin pole and gin wheels.	On initial supply After reinstallation, substantial alteration or major repair At discretion of surveyor	Every twelve (12) months
4	Chain Blocks, tirlfors, pull lifts, trolleys	On initial supply Every four (4) years After substantial alteration or major repair At discretion of surveyor	Every six (6) months
5	Lifts – (passenger or goods)	On initial supply Every four (4) years After substantial alteration or major repair At discretion of surveyor	Every twelve (12) months
6	Escalators And Elevators	On initial supply Every one (1) year	Every six (6)



Regulation IO – 11.0: Lifting Equipment Protocol

		After substantial alteration or major repair At discretion of surveyor At discretion of surveyor	months
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