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كصيتن دان عالم سكيتر  
Safety, Health and Environment  
National Authority

## INDUSTRY GUIDANCE NOTE

TOPIC: <b>APPROVAL AND REGISTRATION OF THIRD-PARTY INSPECTION AGENCIES FOR LIFTING EQUIPMENT</b>			Reference Number: <b>IGN 5/2021</b>
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## **1. SUMMARY**

This Industry Guidance Note (hereinafter referred to as IGN), which is issued by the Safety, Health and Environment National Authority (SHENA), serves as a guidance document and describes the requirements for the Third-Party Inspection Agency (TPIA) for lifting equipment to be approved by the Authority in ensuring consistency of quality service provided by TPIA. Such requirements which are seen as minimum include a management system which shall consist but are not limited to aspects on:

- Accreditation;
- Properly equipped Facilities;
- Suitable and qualified technical and administrative Staff;
- A minimum of two (2) qualified Inspectors;
- Work instruction/programmed;
- Use of a Checklist; and
- The Production of an Inspection Certificate.

This guidance also sets out the minimum competency requirements for lifting equipment inspectors employed under TPIA and persons who wish to be registered with the Authority as an approved Authorised Examiner (AE).

In addition, it sets out the service life of various type of lifting appliances such as cranes which may degrade due to prolonged years of service.

## **2. INTRODUCTION**

### **2.1 PURPOSE**

The Safety, Health and Environment National Authority (SHENA), is the national authority which regulates workplace safety, health and environment as well as radiation matters. It undertakes assessments and registration of various service providers according to International Standards, guidelines and industry best practices.

The requirements for approval and registration of a Third-Party Inspection Agency (TPIA) are the ISO/ IEC 17020:2012 (Conformity Assessment Requirements for the operation of various types of bodies performing inspection) as well as the criteria for performing testing and inspection according to the technical standards defined in the scope of accreditation offered by each TPIA.

These guidelines describe relevant requirements for the approval of the TPIA working in the field of lifting equipment inspections for all types of cranes, suspended equipment, construction hoists, elevators, overhead cranes and their

supporting runways, automotive vehicle lift, a building cleaning cradle and its suspension equipment, goods and passenger lifts, telehandlers and fork lifts, lifting appliance includes a pulley block, gin wheel and chain block or set of chain blocks, lifting gears include any chain, rope, chain sling, webbing sling, rope sling, hook, shackle, swivel or eyebolt and cage, basket or work platform used for carrying persons while it is suspended from the load line of a crane, container, skid, spreader bar etc. and any lifting machine. This approval programme is being implemented in order to provide a means of assessing and accrediting the competence of a TPIA in carrying out inspections and related activities pursuant to the Workplace Safety and Health Order, 2009 (WSHO, 2009).

This document should be read in conjunction with the International Standard ISO/ IEC 17020:2012 Conformity Assessment Requirements for the operation of various types of bodies performing inspections.

While registration with the Authority will normally be an indication of the quality of services offered by the TPIA, it should not be regarded as a guarantee that the TPIA will always maintain a particular level of performance. It shall not, in any way, diminish the contractual obligation between the TPIA and its clients. It is subject to periodic revision when deemed necessary. It is the responsibility of the TPIA to ensure that the latest version of this document is available for reference and implementation.

## 2.2 TERMINOLOGY

Abbreviations, used frequently in this guidance are given in the table below:

Abbreviation/Term	Meaning
AE	Authorised Examiner
API	American Petroleum Institute
ASME	American Society of Mechanical Engineering
BS	British Standard
BSEN	British Standard European Norm
BAPEQS	Board of Architects, Professional Engineers and Quantity Surveyors
FOS	Factor of Safety
ISO IEC	International Organization for Standardization/International Electrotechnical Commission
LEEA	Lifting Equipment Engineering Association
OPITO	Offshore Petroleum Industry Organisation

<b>Abbreviation/Term</b>	<b>Meaning</b>
NDT	Non-Destructive Testing
SHENA	Safety, Health and Environment National Authority
SWL	Safe Working Load
WLL	Working Load Limit
WSHO	Workplace Safety and Health Order
TPIA	Third Party Inspection Agency
UKAS	United Kingdom Accreditation Services

### **2.3 APPLICABLE LAW**

- Workplace Safety and Health Order, 2009
- Workplace Safety and Health (Construction) Regulations, 2014
- Workplace Safety and Health (General Provisions) Regulations, 2014
- Workplace Safety and Health (Incident Reporting) Regulations, 2014

Section 33 of the Workplace Safety and Health Order, 2009

#### **Application for and grant of approval**

(1) An application for approval to act as an authorised person shall be -

- (a)* in such form as the Authority may determine;
- (b)* accompanied by such information, statements and documents as the Authority may require; and
- (c)* accompanied by the prescribed fee.

(2) The Authority shall not approve any person as an authorised person unless he is satisfied that the applicant —

- (a)* possesses the prescribed qualifications and prescribed practical experience; and
- (b)* is sufficiently competent and is, in all other respects, a fit and
- (c)* proper person, to be entrusted to carry out the work of the relevant authorised person.

(3) Upon the approval of a person as an authorised person, the Authority shall issue him with a certificate of approval to act as a relevant authorised person for such period as the Authority may specify therein.

## Workplace Safety and Health (General Provisions) Regulations, 2014

### Regulation 21(1)

#### **Lifting appliances and lifting machines**

No lifting appliance or lifting machine shall be used unless an authorised examiner has –

- (a)* tested and examined the lifting appliance or lifting machine; and
- (b)* issued and signed a certificate of test and examination, specifying the safe working load of the lifting appliance or lifting machine.

### Part XV of the Workplace Safety and Health (Construction) Regulations, 2014

- 134. Strength and stability.
- 135. Capacity chart.
- 136. Thorough examination and inspection.
- 137. Handling of suspended loads.
- 138. Prohibition on riding on loads.
- 139. Cranes or machinery at rest.
- 140. Operators of employee's lift.

### **3. DEFINITIONS**

Section 4(1) of the Workplace Safety and Health Order, 2009 defines lifting machine and lifting gears:

- *Lifting Machine includes*
  - (a) any crane, crab, winch, teagle, runway, transporter, piling frame or piling machine; and*
  - (b) any walk platform or suspended scaffold capable of being raised or lowered by climbers, winches or other powered device.*
  
- *Lifting gear includes*
  - (a) any chain, rope, chain sling, webbing sling, rope sling, ring, hook, shackle, swivel or eyebolt; and*
  - (b) any cage or work platform used for carrying persons while it is suspended from the load line of a crane;*

### **3.1 LIFTING MACHINE (ALSO KNOWN AS LIFTING APPLIANCES)**

Any lifting machine, driven by manual or mechanical power that is able to raise, lower or suspend loads, and includes the supporting structure and all plant, equipment and gear used in connection with such a machine, but excludes continuous mechanical handling devices (i.e. Conveyors) such as but not limited to: -

- a) Cranes (tower, pedestal offshore, mobile such as truck mounted, rough terrain, all terrain etc.);
- b) Wall / Pillar Cranes, Derricks, Swing Jibs and Davits;
- c) Runway Beams, Monorails, All Pad Eyes, Gin Poles and Gin Wheels;
- d) Winches, Hoists (air and electric), Crabs, Telfer Hoists;
- e) Chain Blocks, Wire Rope Pulling Machines, Pull Lifts, Trolleys;
- f) Powered Working Platforms;
- g) Elevators and Lifts;
- h) Excavators;
- i) Forklifts, Self-Loader and Side Booms; and
- j) Lifting Jacks (pneumatic or hydraulic).

### **3.2 LIFTING GEAR (ALSO KNOWN AS LIFTING LOOSE TACKLES (LLT) OR LIFTING ACCESSORIES)**

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

- a) Chains and Wire Ropes;
- b) Chain, Wire Rope and Webbing Slings;
- c) Rings, Links, Hooks, Shackles, Eye Bolts, Swivels, Blocks, Snatch Blocks;
- d) Beam Clamps and Plate Clamps;
- e) Lifting Beams / Spreader Beams; and
- f) Any cage or work platform used for carrying persons while it is suspended from the load line of a crane.

### **3.3 THIRD-PARTY INSPECTION AGENCY (TPIA)**

It is a business organisation, which complies with the ISO 17020 standards. Such organisations are third party inspection agencies which must not be involved in any activities other than inspection, examination and testing. Based on this requirement, the third-party inspection agency must not be involved in design, procurement, fabrication, construction and installation. All companies and parties such as buyers, sellers, engineering companies, plant owners must have access to these agencies and use their services under recognised commercial agreements. The confidentiality, independence, impartiality and integrity are important conditions for being a third-party inspection agency.



### **3.4 AUTHORISED EXAMINER FOR LIFTING EQUIPMENT**

It is an individual who has the appropriate practical and theoretical knowledge as well as the relevant experience of the lifting equipment to be thoroughly examined which will enable him to detect defects or weaknesses and to assess their importance in relation to the safety and continued use of the lifting equipment, and who is approved by the Authority under section 33 of WSHO, 2009.

For any technical staff under TPIA who wishes to be approved as AE, he/she will be required to submit his/her application through his/her company representative (e.g. Human Resource or Administration) ONLY.

For a person who wishes to apply as an AE, he/she must be –

- (a) able to exercise due diligence in making any certification / report or in conducting any test or examination of statutory equipment;
- (b) a professional engineer who holds a valid Practising Certificate (PC) issued by the Board of Architects, Professional Engineers and Quantity Surveyors (BAPEQS) in the relevant Specialised Professional Engineering branch such as Electrical Engineering and Mechanical engineering or in the branch of Building Service Engineering

### **3.5 AUTHORITY**

The Authority is the Safety, Health and Environment National Authority (SHENA) established by the Safety, Health and Environment National Authority Order, 2018.

### **3.6 INSPECTION**

Inspection refers to 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 utilise for a specified period. This includes, but is not limited to, activities such as measuring, testing, recording, checking, analysing, loading and charting one or more characteristics of the equipment.

### **3.7 LOAD**

Means any material, persons or any combination of these that are lifted, lowered or suspended by the Lifting Equipment. The weight of the lifting accessories including the hook block may be considered as part of the load being lifted, as applicable by the relevant standard.

### **3.8 WORKING LOAD LIMIT (WLL)**

This refers to the maximum working load specified by the manufacturer. This load represents a mass or force that is much less than that required to make the lifting equipment fail or yield. It is a calculation of the Minimum Breaking Load (MBL) divided by a safety factor, usually ranging from a safety factor of 4 to 7 for Lifting gears.

### **3.9 SAFE WORKING LOAD (SWL)**

This refers to the maximum load as specified in the certificate of test and examination, which an item of lifting equipment may raise, lower or suspend under particular service conditions.

Note:

The main difference between SWL and WLL is that the WLL is given by the manufacturer and does not account for particular service conditions which may affect the final rating of the equipment. While SWL is given by an Authorised Examiner and stated in the inspection certificate, SWL does account for the service condition. SWL may be lower than WLL, e.g. a wire rope sling choked on a square load without any corner protection has its safe working load at approximately 50% of its WLL.

### **3.10 PROOF LOAD TEST**

This refers to 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. 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.

### **3.11 THE MINIMUM BREAKING (OR FAILURE) LOAD (MBL)**

This is the theoretical load below which a sample of the item will not break or fail, when new.

### **3.12 FACTOR OF SAFETY (FOS) OR COEFFICIENT OF UTILISATION OR WORKING COEFFICIENT**

This refers to a factor that is applied to the MBL to determine the WLL. It varies with the product to take account of the susceptibility to damage and considers the type of stresses the item will withstand in normal use. Where the conditions of use are more severe than those considered by the product standard, the user would apply an increased FOS, so reducing the value of the SWL from that of the WLL.

### **3.13 INSPECTION CERTIFICATES (OF LIFTING EQUIPMENT)**

This refers to all original Inspection Certificates issued by the approved TPIA. These Certificates indicate compliance of lifting equipment with safety requirements and its fitness for use and shall be a certificate both in name, detail and

format. Each Inspection Certificate shall contain the minimum details as specified under section 5.6. A certificate shall not be issued where the lifting equipment does not comply fully with the requirements of the relevant standards and the requirements of this document. The Certificate shall be signed by the authorised Inspector who has performed the inspection.

### **3.14 INSPECTION REPORT (OF LIFTING EQUIPMENT)**

When the lifting equipment does not comply with the requirements of the relevant standards, an Inspection Certificate cannot be issued. Instead an Inspection Report shall be issued which shall contain the applicable information under section 5.6.1 in addition to the full description as to why the lifting equipment failed the inspection. If during the thorough examination, defects are found, then the AE is required to notify the owner of the equipment immediately and make a report and to the person from whom the equipment has been hired as soon as practicable; send a copy of the report to the Authority where the defect in the equipment presents an imminent risk of serious injury. An employer /owner of the equipment who receives a report on defects in equipment is legally required to ensure, that the equipment is not used before the defect is rectified.

### **3.15 NON-DESTRUCTIVE TESTING (NDT)**

This refers to testing carried out on the structure of the lifting equipment to establish the presence, location and extent of any defects that can affect the integrity of that structure.

NOTE: The techniques employed for non-destructive testing are such that they do not damage or alter the material under test.

NDT is also known as non-destructive examination (NDE).

### **3.16 CRITICAL COMPONENTS AND BEARING AREAS**

This refers to those components and areas that if failure occurs, the lifting equipment may become unstable and/or cause the load to drop. Critical load bearing parts shall be visually inspected during thorough examination and might be required to be NDT using an appropriate testing method to ascertain their integrity. For Example, a crane's Load bearing parts may be considered as, but are not limited to Main Jib/Boom, Fly Jib and / or attachments, "A" Frame mast, Slew rings Hook blocks, Sheave and Sheave shaft, Boom heel, etc.

### **3.17 THOROUGH EXAMINATION**

A thorough examination is a systematic and detailed examination of the lifting equipment by the AE to detect any defects that are, or might become dangerous. Carried out at specified intervals by an AE who shall then complete a written inspection certificate. Where serious defects are identified, an AE carrying out the examination must

immediately report to the owner of the equipment. This should then be followed by the formal inspection report, a copy of which must also be sent to the authority if the defect is imminent risk. For example, the following items shall be checked for compliance with manufacturers' specifications and safe operation, as a minimum during thorough examination of the crane:

- a) Oil levels, fuel level and lubrication;
- b) Ropes, rope terminal fittings and anchorages, rope drums and sheaves for any damage and wear;
- c) All water is drained from air reservoirs;
- d) 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;
- e) 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;
- f) Load moment system where fitted is correctly set or fitted (or both) with the programme appropriate to the boom or jib length, and fly-jib lengths and falls or parts of rope;
- g) Indicator appropriate to the boom, jib or fly-jib length is fitted;
- h) 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;
- i) Pneumatic systems and hydraulic systems including their safety devices;
- j) Operation of the crane through all motions with particular attention to brakes;
- k) Operation of all limit switches or cut-outs and safety devices;
- l) Where telephone or radio communications are being used, the calling signal is functioning and any messages may be clearly heard;
- m) Fire extinguishers are in place and satisfactory for use; and
- n) Record is maintained of all the checks made and results received.

### **3.18 PERIODIC INSPECTIONS**

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 intervals exceed 12 months for lifting machine/appliances and bi-annually for loose lifting tackles.

The inspections shall include all items specified by the manufacturer for an annual inspection together with all routine inspection items.

If the manufacturer's recommendations are not available, AE 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: As the result of a periodic inspection, AE may recommend a major inspection/overhauling.

### **3.19 OVERHAULING**

This refers to the process of restoring and maintaining an equipment, machine or system in a serviceable condition.

Overhaul involves –

- (1) partial or complete disassembly of the item;
- (2) inspection to detect damaged, defective or worn parts;
- (3) repair or replacement of such parts; and
- (4) reassembly, testing, and trial-run prior to returning the item to its full operating level.

NOTE: Mobile Cranes that have reached the end of their design life or, where this is unknown, shall be overhauled as per Annex 3. A crane's design life may not be the same as its actual life and depends on such factors as its classification, usage and its operating environment.

## **4. SCOPE**

This IGN covers two programmes to enhance the safe integrity of lifting equipment. The programmes are –

- (1) in-service inspection of lifting equipment; and
- (2) the Limit of the Service Life of Mobile Cranes and extension of its service life.

### **4.1 IN-SERVICE INSPECTION OF LIFTING EQUIPMENT**

The in-service inspection of lifting equipment, includes inspection undertaken after installation and prior to being put into service. An Approved TPIA under this programme provides one or more of the following services: -

- a) Development of schemes of in-service inspection as per international standards;
- b) In-service inspection of equipment to detect actual and incipient defects and judgements on the significance of such defects for continued safe use. If a defect is identified by AE, its significance shall be made clearly known to the person responsible for the operation of the equipment. E.g. if a component is cracked, then it shall not continue to be in use until appropriately repaired or replaced. The AE must advise (in writing) the owner or his representative of this fact before leaving the site;

- c) Reporting the result of the in-service inspection, specifying any repair service or replacement action and/or recommendations necessary to return the lifting equipment to a state of compliance with the appropriate standards referred to in Annex 3;
- d) Inspection during or following repair service or replacement action; and
- e) Provide a copy of the report to the Authority where the defect in the equipment presents an imminent risk of serious injury.

**NOTE:**

A Third-Party Inspection Agency must be independent to the owner of the equipment under review or inspection.

#### **4.1.1 CATEGORY OF LIFTING EQUIPMENT**

There are three main categories of lifting equipment under this programme:

a) Category A: Lifting Accessories or Loose Gear (Attachments or Lifting Gear)

Lifting accessories covers the whole range of equipment used for attaching loads to Lifting Appliances. Examples are Swivels, Master link, Clamps, Shackles, Slings, Rings, etc.

b) Category B: Manual Lifting Equipment

Manual lifting appliances cover a wide range of equipment used for lifting and means any stationary or mobile equipment including attachments for anchoring, fixing or supporting equipment which is operated solely by means of the operator without any powered assistance.

c) Category C: Powered Lifting Equipment

Powered lifting equipment covers a wide range of equipment used for lifting load either vertically or horizontally or both and means any stationary or mobile equipment including attachments for anchoring, fixing or supporting equipment, which is operated by means of motive power e.g. electric, hydraulic or pneumatic or other powered means. Examples are like: Mobile Cranes, Overhead Cranes, Tower Cranes, Crawler Cranes, Gantry Cranes, Jib Cranes, Slewing Jib Cranes, Derrick Cranes, Construction Hoists, Cradles, Elevators, Lifts, Escalators, etc.

#### **4.1.2 SUBCONTRACTING**

Where the TPIA subcontracts certain specialised activities temporarily for part or all of its inspection activities for unforeseen extra work load or any other reasons, there must be identifiable member(s) of the management personnel sufficiently knowledgeable in those technical activities being subcontracted, to be able to:

- a) Define the problem adequately to enable the subcontractor to offer appropriate services, personnel and equipment;
- b) Choose an appropriate subcontractor and to assess its technical competence (e.g. methods, personnel and facilities);

- c) Interpret the results supplied by the subcontractor and relate those results properly to the service originally requested or problem originally defined.
- d) As for NDT activities when the inspection body subcontracts any of such activities related to lifting equipment inspection, the inspection body must use a competent subcontractor, which complies with the criteria stipulated in the relevant standard of ISO/IEC 17000 series; i.e. clause 6.3 of ISO/IEC 17020:2012 or relevant clause of ISO/IEC 17025.

#### **4.2 LIMIT OF THE SERVICE LIFE OF THE MOBILE CRANES AND OTHER LIFTING MACHINE**

The objective is to carry out a thorough assessment on a mobile crane and other lifting machine for the purpose of extending its service life beyond the maximum stipulated service life for that class of cranes. The scope of work includes:

-

- a) Assessment of the Case Proposal and the Inspection and Maintenance Scheme prepared by the owner of the crane;
- b) Recommendation of an estimated remaining service life for the crane (refer to Annex 3 for more details); and
- c) At the end of the assessment, the TPIA shall furnish a report to the Authority through the owner of the crane indicating the Case Proposal's compliance with the relevant codes and guidelines, and recommend the remaining service life of the crane/lifting machine. The report would then be used as supporting document by the crane owner to apply for the extension of the service life of the mobile crane/lifting machine.

### **5. GENERAL REQUIREMENTS**

The TPIA applying to be approved by the Authority shall have a management system, which includes the following as a minimum:

- a) ISO/ IEC 17021:2012 (General criteria for the operation of various types of bodies performing inspections) is mandatory. ISO9001 (quality management system) and LEEA (Lifting Equipment Engineering Association) accreditations are preferable. Certifications granted to the TPIA with full details such as Scope of the Accreditation, Certificate Number and Expiration of Certificate to be submitted.
- b) A TPIA which does not have a recognised accreditation, may be granted a provisional approval until it obtains the relevant accreditation. This is provided that it has submitted proper documentation to the Authority, 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 17020:2012 and any additional technical guidelines.

- c) Facilities properly equipped with the equipment and instruments appropriate for the type and range of inspections undertaken by TPIA.
- d) Employ suitable and qualified technical and administrative staff.
- e) TPIA shall have at least two (2) qualified inspectors under its direct employment (see Annex 1 for the Guideline Criteria for Third Party Inspection Agency for Lifting Equipment for Inspectors).
- f) TPIA shall use checklist forms containing all the requirements of relevant BS/ EN inspection standards prepared internally.
- g) TPIA shall prepare work programme/ work instruction for its activities with a frequency suitable to its nature of work.
- h) TPIA shall produce an Inspection Certificate for lifting equipment on the inspection to fulfill the client's needs, the related authority requirements and the applicable clauses of international standard such as (BS, BSEN, ISO, ASME, API, etc.).
- i) When the lifting equipment does not comply with the requirements of the relevant standards, an Inspection Certificate shall not be issued. Instead an Inspection Report shall be issued which shall contain the applicable information, such as full description as to why the lifting equipment failed the inspection. AE is then required to notify the owner of the equipment immediately; make a report as soon as practicable; and send a copy of the report to the Authority where the defect in the equipment presents an imminent risk of serious injury. An employer who receives a report on defects in the equipment is required under this IGN to ensure that the equipment is not used before the defect is rectified.
- j) TPIA shall be independent to the owner of the equipment under review or inspection.

## **6. SPECIFIC CRITERIA**

### **6.1 REQUIREMENTS FOR TECHNICAL COMPETENCY OF STAFF**

TPIA shall employ personnel who are tasked to carry out inspections of lifting equipment to have the qualifications, training, experience and knowledge of the requirements of the inspections to be carried out. TPIA shall maintain records of such qualifications, training and experience, and information as to show how and when, each personnel was authorised to perform specific in-service inspection activities in accordance with ISO / IEC 17020:2012 section 6.1, the scope for which he is authorised and the sample of his signature. These records shall, as a minimum, indicate the category of lifting equipment as defined in section 3.1.1.

TPIA shall only authorise personnel to carry out in-service inspections of lifting equipment if the inspections are within the designated competence of that personnel and if that personnel holds the category of qualification necessary to inspect the types of the equipment as shown in Annex 1.



No AE is allowed to perform inspection independently without having the appropriate qualifications, training and experience. TPIA shall assess the competency of their inspectors and this assessment shall cover relevant international standards, codes of practice, local legislation and inspection techniques. The Authority shall be given the opportunity to review the means of such an assessment.

**Note:** For self-employed inspector who wishes to be registered with the Authority as approved AE, he/she shall meet the requirements as stipulated in Annex 2.

### **6.1.1 EDUCATIONAL BACKGROUND AND QUALIFICATIONS**

TPIA shall ensure that the competent personnel carrying out a thorough examination has such appropriate practical and theoretical knowledge and experience of the lifting equipment to be thoroughly examined as will enable them to detect defects or weaknesses and to assess their importance in relation to the safety and continued use of the lifting equipment. The TPIA shall have the following staff:

#### **6.1.1.1 CHIEF INSPECTOR/ SENIOR INSPECTOR/ TECHNICAL MANAGER**

TPIA shall have available one or more person(s) as Technical Manager / Chief Inspector / Senior Inspector who have overall responsibility to ensure that the inspection activities are carried out in accordance with International Standards.

This person/person must have at least 15 years of hands-on experience within a relevant engineering discipline of which at least 10 years shall have been spent working within an engineering discipline related to lifting equipment, or if he/she holds a B.Sc. Engineering Degree, shall have at least eight (8) years' experience with minimum four (4) years working within an engineering discipline related to lifting equipment.

#### **6.1.1.2 INSPECTORS**

An inspector must have at least 3 years hands-on experience spent working within an engineering discipline related to lifting equipment, or if he/she holds a B.Sc. Engineering Degree, shall have at least one (1) years' experience working within an engineering discipline related to lifting equipment.

### **6.1.2 LEVELS OF SUPERVISION AND REQUIREMENTS FOR TECHNICAL SUPPORT**

The extent and frequency of supervision and technical support exerted by the TPIA over its staff must be proportional to the level of experience and training of the technical staff, the criticality of equipment under inspection and the existence of regulatory requirements for the concerned field of inspection. The following are the minimum supervision required:

- a) Technical Manager or his/her deputy such as Chief Inspector /Senior Inspector is responsible for the review of all certificates and inspection reports prior to the documents being issued.

- b) Technical support from persons qualified such as the Technical Manager / Senior Inspector to his/her colleagues or inspectors.
- c) No under-training inspector shall be allowed to perform inspection activities independently under any circumstances.

### **6.1.3 TRAINING AND ASSESSMENT**

#### **6.1.3.1 TRAINING**

The training provided by TPIA to its staff shall consist of a working knowledge of lifting equipment and its systems including design construction, operation, maintenance, significance of defects, typical problem areas and associated method of rectification.

Training provided by reputable training organisations such as (but not limited to) Lifting Equipment Engineers Association (LEEAA), API (American Petroleum Institute), OPITO (Offshore Petroleum Industry Organisation) or equivalent is also recognised by the Authority.

In addition to the international training, internal/local training is also required which shall include the safe conduct of the inspectors' duties, in particular safe practices applicable to lifting equipment, risk assessment, knowledge of applicable statutory requirements, codes of practice and standards applied.

#### **6.1.3.2 ASSESSMENT OF AE FOR THE PURPOSE OF APPROVAL**

AEs will be assessed by reviewing their resume against the criteria stipulated within Annex 1 for an inspector employed under TPIA and Annex 2 for self-employed inspectors respectively. Notwithstanding this, the Authority may require for a technical interview to be conducted and may witness their performance in the field.

## **6.2 REQUIREMENTS FOR SITE WORK**

### **6.2.1 PREPARATION FOR SITE WORK**

The law requires thorough examinations shall be carried out in a safe manner. Inspectors involving with inspection, would be exposed to different type of hazards. To avoid injuries or fatalities, employers of an AE have legal duties under section 12 of Workplace Safety and Health Order, 2009 to ensure safety at work of their employees as far as is reasonably practicable, by providing such information, instruction, training and supervision as is necessary. Employers should ensure safe working arrangements for their employees. Particular hazards should be identified by carrying out

the risk assessment and planning of the work. Personnel protective equipment (PPE) such as gloves, hardhats and reinforced safety footwear are a must, as well as a personal fall arrest system, should be provided.

Additionally, TPIA shall ensure the following:

- a) TPIA shall allocate inspection activities based from the work programme for each AE in the form of Work Orders. Work Orders to be used by AE on site shall contain the following information as a minimum:
  - Identifiable number traceable to the client request/ contract;
  - Type of the equipment and related information about critical items to be inspected;
  - Site Location (site map is recommended to be provided);
  - Work Instructions for the inspections;
  - Contact person on behalf of the TPIA's client;
- b) Upon arriving at any inspection site, there shall also be an obligation from AE to enquire the following information from:
  - (i) Information about previous inspections;
  - (ii) Manufacturing Operations Manual, Operator or Maintenance Manuals of the equipment, Safe Working Load (SWL) charts in English and/Malay language (if available). The TPIA might ask the owner of the equipment to engage an independent competent person such as qualified person (QP) or independent professional engineer (IPE) to provide advice and documentation to support the continued use of the lifting equipment on foundations, building ties, engineering drawings, Installation procedures, etc;
- c) The AE should review and address every issue raised in the previous Inspection Certificate / Inspection Report, if any;
- d) AE shall verify the competency of the operator of the lifting equipment to carry out all operations required by the relevant standards, if applicable;
- e) Prior or carry out load test or performance test, risk assessment, lift plan and Tool Box Talk (TBT) shall be conducted, Permit to Work (PTW) shall be obtained.

### **6.2.2 INSPECTORS CHECKLISTS**

TPIA shall use Checklist forms containing all the requirements of acceptance and rejection criteria based on relevant international inspection standard prepared internally. The Checklist forms shall contain sufficient space to indicate the results of the evaluation using the inspection methods. The AE shall sign the Checklist after recording all necessary information.

### 6.2.3 REPORTING DEFECTS IN EQUIPMENT UNDER INSPECTION

AE is required to be capable of identifying all types of defects found in equipment under inspection. If the equipment is found to be unsafe and represents an imminent danger, the AE shall advise the owner to cease the use of the equipment and report this matter immediately to the Authority.

### 6.2.4 INSPECTION METHODS AND PROCEDURES

TPIA shall use methods and procedures for inspection which are defined in relevant updated International Standards such as (BS, BSEN, ASME, API, etc.) standards in the field of inspection of lifting equipment when performing inspection. It is the responsibility of TPIA to ensure that these requirements and latest relevant standards detailed in Annex 4 are available at the TPIA offices. In addition, the manufacturer's technical literature applicable to the equipment shall also be part of the inspection methods. Where these are not defined, the TPIA shall develop specific methods and procedures to be used (see Section 7.1.3 of ISO/IEC 17020). When TPIA has to use inspection methods or procedures which are non-standard, such methods and procedures shall be appropriate and fully documented. The inspection body shall inform the client if the inspection method proposed by the client is considered to be inappropriate.

TPIA shall have documented procedures and appropriate facilities to avoid deterioration or damage to inspection items while under its responsibility e.g. during Load Test of container, load should be evenly distributed over the container floor and not concentrated to avoid damage of the container.

### 6.3 THOROUGH EXAMINATION FREQUENCIES

In order to verify that lifting equipment and accessories remain safe for use and to detect and remedy any deterioration in good time, thorough examinations are required throughout the lifetime of the equipment, including examinations:

- a) **Before use for the first time** - If it was assembled on site, it must be examined by a competent person to ensure that the assembly (e.g. a platform lift installed in a building) was completed correctly and safely;
- b) **After assembly and before use at each location** - for equipment that requires assembly or installation before use, e.g. tower cranes;
- c) **If regularly in service - thorough examinations should be conducted every:**
  - 6 months, for lifting equipment and any associated accessories used to lift people;
  - 6 months, for all lifting accessories; and
  - 12 months, for all other lifting equipment.

- d) **Examinations conducted in accordance with an examination scheme, drawn up by a competent person;**
- e) **Following exceptional circumstances** – where they are liable to jeopardise the safety of lifting equipment, which may include:
  - damage or failure;
  - being out of use for long periods;
  - major changes, which are likely to affect the equipment's integrity (e.g. modifications, or replacement / repair of critical parts).

### **6.3.1 WHAT IS COVERED BY A THOROUGH EXAMINATION?**

This depends on the professional judgement of the AE undertaking the examination, which requires the needs to include all matters which affect the safety of the lifting equipment, including likely deterioration with time.

For most common lifting equipment and accessories, there are industry standard procedures and criteria (acceptance and rejection criteria) which an AE would follow when undertaking thorough examinations and making judgements as to the continued safety of the equipment. Methods used include:

- Visual examination and functional checks;
- Measurements of wear and tear;
- Proof load test;
- Supplementary test such as NDT (non-destructive testing) and continuity test;
- some disassembly or internal examination of parts may also be required.

### **6.3.2 PROOF LOAD TEST OF LIFTING EQUIPMENT**

Most lifting equipment does not need routine testing as part of the thorough examination. In fact, some overload tests can cause damage to lifting equipment. Where testing is deemed necessary, it may not need to be undertaken at every thorough examination. The need for and nature of, testing should be based on an assessment of risk, taking account of information from the manufacturer and other relevant information as determined by the AE.

## **6.4 MAINTENANCE AND INSPECTION OF LIFTING EQUIPMENT**

To ensure safe and satisfactory operation of the lifting equipment, a proper preventive maintenance system shall be established and used. Manufacturer's instruction books recommend that specific tasks be carried out at stated intervals,

and these periods shall not be exceeded. They also specify the lubrication points that require attention, the interval or frequency of greasing and oil changes and the grades and quality of lubricant to be used. The instruction books also cover other essential maintenance such as replacement of filters, frequency for checking the security of fixing bolts and recommended torque settings and other adjustments, e.g. clutches and brake.

An effective preventive maintenance system shall recognise the possible need to prohibit the use of the lifting equipment until essential maintenance work is carried out. A record shall be kept for the lifting equipment, giving information on the major components used in the lifting equipment, e.g. rope diameters, lengths, construction and breaking loads, make and model of motors, pumps, gear boxes, winches, and drives, electrical and hydraulic equipment.

Thorough examination should not be confused with preventive maintenance, although they have some elements in common. Preventive maintenance usually involves replacing worn or damaged parts, topping up fluid levels and making routine adjustments to ensure risks are avoided. Thorough examination may act as a check that maintenance is being carried out properly, but is not intended to replace it.

Copies of the crane maintenance schedules and maintenance records, NDE reports and previous certificates of examinations shall be provided to the AE by the equipment owner prior to any examination. In case of absence of maintenance records, AE shall reject the inspection.

Lifting accessories do not normally need formal maintenance, provided that proper pre and post use checks by end user are made and they undergo their standard thorough examination by AE every 6 months.

## **6.5 EQUIPMENT USED FOR INSPECTION**

Testing equipment and instruments owned or used by TPIA for testing, measuring, gauging (functional or other tests) of lifting equipment shall be calibrated before being put into service, and thereafter calibrated according to an established programme which complies with the relevant requirements of section 6.2.7 ISO/IEC 17020.

## **6.6 INSPECTION CERTIFICATE**

After a TPIA has completed an inspection of lifting equipment and it was found there are no significant issues, the TPIA must issue an Inspection Certificate for the Lifting Equipment.

The Certificate shall include the following information as a minimum in accordance with ISO/IEC 17020 Annex B:

a) Designation of the document, i.e. as an inspection report or an inspection certificate, as appropriate;

- b) Identification of the document, i.e. date of issue and unique identification, etc.;
- c) Identification of the client Lifting Equipment's Owner/ Contractor name and address;
- d) Description of the inspection work ordered;
- e) Date(s) of inspection and type of inspection;
- f) Information on where the inspection was carried out including the address of the premises at which the inspection was made;
- g) Manufacturer or Supplier of equipment name and address;
- h) Particulars sufficient to identify the lifting equipment including its date of manufacture;
- i) Unique Identification Numbers, brief description and SWL of the equipment;
- j) Any reservations or restrictions on the use or Maximum Capacity of the equipment;
- k) Identification or brief description of the inspection method(s);
- l) Procedure(s) used, and stating the deviations from, additions to or exclusions from the agreed methods and procedures;
- m) Identification of equipment used for measuring/testing;
- n) If any part of the inspection work has been subcontracted, the results of this work shall be clearly identified;
- o) The Due date of next Thorough Inspection;
- p) The Due date of next Proof Load Test, if applicable;
- q) Applicable Reference Standard / Code;
- r) Details of any major Repairs / Alterations carried out on the equipment (owner should inform AE of any modifications or structural repairs);
- s) Details of latest Inspection / Tests previously performed including any NDT if possible;
- t) Measuring units (for Loads / Weights) shall be in metric ton (tonne);
- u) The results of the inspection including a declaration of conformity and any defects or other non-compliances found (results can be supported by tables, graphs, sketches and photographs);
- v) The inspector's mark or seal, if any;
- w) Names (or unique identification) of the staff who have performed the inspection; and
- x) Inspection report / Inspection Certificate to be countersigned by the Technical Manager/Senior Inspector.

### **6.6.1 INSPECTION REPORT**

When a TPIA undertakes an inspection of lifting equipment and finds items that do not comply with the requirements of the relevant Standards, the TPIA shall decline to issue an Inspection Certificate, but shall issue a separate document called an Inspection Report. Details of the Inspection Report shall be as similar as section 5.6, with the following additions -

- a) Identification of any part found to have a defect which is or could become a danger to persons, and a description of the defect;
- b) Particulars of any repair, renewal or alteration required to remedy a defect found to be a danger to persons;
- c) In the case of a defect which is not yet but could become a danger to persons-
  - the time by which it could become such danger;
  - particulars of any repair, renewal or alteration required to remedy it.

Important Notes:

Re-inspection shall be performed by the same TPIA for equipment that failed the inspection.

Any form issued by a TPIA other than the Inspection Certificate /Inspection Report will be rejected by the Authority.

## **6.7 APPLICATION**

Any organisation which complies with the following requirements may apply to be an approved Third-Party Inspection Agency for Lifting Equipment.

- All technical requirements set out in this IGN;
- Be incorporated or registered in Brunei Darussalam;
- Has an office in Brunei Darussalam;
- Employs competent Authorised Examiners or inspectors, who are based in Brunei Darussalam;
- Possesses a Certification of ISO 17020 in respect of the Brunei office with full details such as scope of the accreditation, certificate number and expiration of certificate.

The applicant shall be a person who:

- Holds an executive position in the Head Office;
- Is responsible of maintaining the Quality Assurance Manual;
- Can act as liaison between the organisation and the Authority;
- Is knowledgeable with the organisation's operations; and
- Has the knowledge and experience in the relevant work and activity.



### 6.7.1 DOCUMENTS TO BE SUBMITTED

The following supporting documents must be submitted with the application:

- a) Completed application form;
- b) A narrative description of the Organisation's commitment to the work scope and services covering the following aspects:
  - History of the organisation since its formation;
  - Organisation goals and policies;
  - Types of work scope and services (please indicate the Codes and legislation used in the country);
  - Countries in which work scope and services can be rendered; and
  - Staff skill and training programmes.
- c) Details of all partners, directors and key inspection personnel;
- d) A copy of the ISO certificate testifying to the quality management system of the organisation. If the existing organisation is not ISO certified, **provisional** approval may be granted provided that they have Quality Management System in place reviewed by the Authority.

**Note: - Approved TPIAs without ISO's certification, will be provisionally approved until they have attained full accreditation.**

- e) Copies of the approval certificates, testimonials or letters from relevant government authorities.
- f) Sample copies of Test reports; Inspection Reports and Certificates; Any technical reports.
- g) The documents submitted shall be in the English language.

### 6.7.2 APPROVAL CERTIFICATE

The Authority shall only approve the organisation as an approved Third-Party Inspection Agency and issue a certificate of approval, if the Authority is satisfied based on the submission of the supporting documents that the applicant is competent to carry out the relevant scope of work and services.

### 6.7.3 PLANNED ANNOUNCED VERIFICATION VISITS

The approved Third-Party Inspection Agency shall be subject to planned verification visits that will be carried out at least two (2) times per year. The purpose of the verification visits is to ensure that the TPIA is continuing to comply with the requirements.

#### **6.7.4 DE-REGISTRATION OF TPIA & AE**

In the case of an accident involving lifting equipment inspected by an approved TPIA/ AE and as a result of the official investigation, it was determined that the TPIA/AE were responsible, the Authority shall immediately suspend the approval of the TPIA and revoke the approval of the AE who performed the concerned inspection from the list of approved AEs. The Authority will then undertake a detailed immediate special assessment related to the Quality Managed System (QMS) and technical competence of the TPIA. If the accident involves serious injuries or fatalities, the Authority shall withdraw the approval of the TPIA for the related scope with immediate effect.

#### **7. REFERENCE:**

- **UKAS RG 0-2018: Guidelines on the Competence of Personnel Undertaking Engineering Inspections**
- **UKAS RG 6-2019: Accreditation for In-Service Inspection of Lifting Equipment**
- **LOLER-1998: Safe use of Lifting Equipment: Lifting Operations and Lifting Equipment Regulations 1998**
- **ISO/IEC 17020:2012: Conformity assessment — Requirements for the operation of various types of bodies performing inspection**
- **Singapore WSH circular Number: OSD / ENG-CIR / LE-3 / 02 ( Limit on the years of service of mobile cranes: Extension criteria for the service life of mobile cranes)**

## Annex 1 Guideline Criteria for Third Party Inspection Agency for Lifting Equipment for Inspectors

Item	Description	Criteria
1.	Age	Above 21 years old and below 65 years old at last birthday.
2.	Medically fit	Valid medical certificate from registered medical practitioner to be submitted with application.
3.	Academic Certification	<p>(a) Either holds Chartered Engineering Degree with appropriate experience.</p> <p>(b) Or a recognised HND in mechanical engineering or equivalent and holds the professional qualifications in the following categories.</p>
4.	Professional Qualification	<p><b>A-</b> In respect of Category A: Lifting Accessories which are defined as Lifting Accessories or Lifting Gear attaching loads to Lifting Appliances (Attachments or Lifting Gear, also known as Lifting Jackets). Examples are like Runway Shackles, Slings, Rings, etc.,</p> <ol style="list-style-type: none"> <li>1. Rigging and slinging.</li> <li>2. LEEA part 1 (Lifting Equipment Engineers Association) PIE - Part 1 Entrance Certificate.</li> <li>3. LEEA part 2 for LEG - Lifting Equipment General Diploma.</li> <li>4. CSWIP 3.0 (Certification Scheme for Welding and Inspection Personnel).</li> <li>5. NDT (Non-Destructive Testing) for MPI Magnetic particle Inspection and DP (Dye Penetrant).</li> </ol> <p><b>B-</b> In respect of Category B: Manual Lifting Equipment which covers a wide range of Equipment used for lifting and mea</p>

any stationary or mobile Equipment including attachments for anchoring, fixing or supporting that Equipment which is operated solely by means of the operator without any powered assistance,

1. Rigging and slinging.
2. LEEA part 1 (Lifting Equipment Engineers Association) PIE - Part 1 Entrance Certificate.
3. LEEA part 2 for LEG - Lifting Equipment General Diploma.
4. CSWIP 3.0 (Certification Scheme for Welding and Inspection Personnel).
5. NDT (Non-Destructive Testing) for MPI Magnetic particle Inspection and DP (Dye Penetrant).
6. LEEA part 3 for LMM - Lifting Machines Manual Diploma.
7. LMP - Lifting Machines Power Diploma.

C- In respect of Category C: - Powered Lifting Equipment which covers a wide range of Equipment used for lifting load either vertically or horizontally or both and means any stationary or mobile Equipment including attachments for anchoring, fixing or supporting that Equipment, which is operated by means of motive power e.g. electric, hydraulic or pneumatic or other powered means of which are Mobile Cranes, Overhead Cranes, Tower Cranes, Crawler Cranes, Gantry Cranes, Jib Cranes, Slewing Jib Cranes, Derrick Cranes, Construction Hoists, Cradles, Elevators, Escalators, etc.,

1. Rigging and slinging.

2. LEEA part 1 (Lifting Equipment Engineers Association) PIE - Part 1 Entrance Certificate.
3. LEEA part 2 for LEG - Lifting Equipment General Diploma.
4. CSWIP 3.0 (Certification Scheme for Welding and Inspection Personnel).
5. NDT (Non-Destructive Testing) for MPI Magnetic particle Inspection and DP (Dye Penetrant).
6. LEEA part 3 for LMM - Lifting Machines Manual Diploma.
7. LEEA part 4 LMP - Lifting Machines Power Diploma.
8. LEEA part 5 RCS - Runways & Crane Structures Diploma.
9. LEEA part 6 OCE - Offshore Container Diploma.
10. LEEA part 7 OTC Overhead Travelling Crane Diploma.
11. LEEA part 8 MCE Mobile crane Examination.
12. API (American Petroleum Institute) 2D (for offshore crane inspector).
13. CSWIP 3.1.

5. Technical Experience

*(a)* In respect of a Senior Inspector:

He/she must have at least 15 years of hands-on experience within a relevant engineering discipline of which at least 10 years shall have been spent working within an engineering discipline related to lifting equipment or if he/she holds a B.Sc.

Engineering Degree, shall have at least 8 years' experience with minimum 4 years working within an engineering discipline related to lifting equipment.

*(b)* In respect of an Inspector:

He/she must have at least 3 years hands-on experience spent working within an engineering discipline related to

lifting equipment or if he/she holds a B.Sc. Engineering Degree, shall have at least one year's experience working within an engineering discipline related to lifting equipment.

**6. Standards and Codes**

Familiar with codes and standards related to lifting equipment and steel structure such as ASME, ANSI, API, BSEN, BS, ISO etc.

## **Annex 2 Technical Guideline for a self-employed person who wishes to apply as an Authorised Examiner**

- Must be a professional engineer who holds a valid Practising Certificate (PC) issued by Board of Architects, Professional Engineers and Quantity Surveyors (BAPEQS) in the relevant Specialised Professional Engineering branch such as Electrical Engineering and Mechanical Engineering or in the branch of Building Service Engineering;
- Must possess the relevant experience of the lifting equipment to be thoroughly examined which will enable him to detect defects or weaknesses and to assess their importance in relation to the safety and continued use;
- Must not be involved in any activities other than inspection and testing (confidentiality, independence, impartiality and integrity are important conditions for being an independent Authorised Examiner);
- Must not conduct any test or examination of equipment outside the scope approved by the Authority;
- Must be able to physically carry out test and examination and the appointment of a proxy / another person to act on behalf and to conduct inspection is not allowed.

## Annex 3 Technical Guideline on Extension Criteria for Service Life of Mobile Cranes and other lifting machines

### 1. INTRODUCTION

- 1.1. The maximum service life of crawler, truck or wheel mounted mobile crane and another lifting machine shall not exceed that as shown in Table A.

Table A

Design Safe Working Load (Maximum Capacity)	Maximum allowable years of service from the year of manufacture
50 tons and below (including Hiab truck crane)	20
Above 50 tons but not more than 100 tons	25
100 tons and above	30
Forklift	20
Excavator	20

- 1.2. The maximum service life of such a crane/lifting machine may be extended subject to the prior approval of the Authority.
- 1.3. If the Authority is satisfied that the crane/lifting machine is safe for use during the period of extension, the Authority may, subject to conditions, extend the service life of the crane to a period specified in the extension approval document.
- 1.4. The owner of a mobile crane/ lifting machine who wishes to extend the service life of his/her crane/lifting machine may apply for the extension by submitting to the Authority a ***Proposal for Extension of Service Life of a Crane***. This proposal shall comprise the following:

- (a) **A Case Proposal;**
- (b) **An Inspection and Testing Report;**



**(c) A Final Assessment and Recommendation Report.**

1.5. The owner of the mobile crane/lifting machine shall prepare the Case Proposal. The owner shall engage an ***approved Authorised Examiner (AE) for lifting equipment*** who shall carry out the inspection, arrange for testing, conduct an assessment, estimate the remaining service life of the crane and propose an inspection / maintenance scheme.

1.6 The elements of the Assessment Procedures to be considered are outlined as follows: -

<p align="center"><b>ELEMENTS OF THE ASSESSMENT PROCEDURES FOR EXTENSION OF SERVICE LIFE OF THE CRANE</b></p>	<p align="center"><b>TO BE PERFORMED BY</b></p>
<p><b>I. Case proposal:</b></p> <p><u>Part 1</u> of the Case Proposal is a written record of the crane/lifting machine detailing the following:</p> <ul style="list-style-type: none"> <li>a) Usage patterns (e.g. number of operating cycles per hour at certain loading condition);</li> <li>b) Records of any past accidents, failures, defects that could</li> <li>c) affect the structural integrity of the crane/lifting machine, and repair/ replacement carried out;</li> <li>d) Records of maintenance carried out;</li> <li>e) Possible modes of failure.</li> </ul> <p><u>Part 2</u> of the Case Proposal consists of a proposed scheme to evaluate the remaining service life of the crane/lifting machine and shall include the following:</p> <ul style="list-style-type: none"> <li>a) The methodology and assessment employed including testing</li> <li>b) and inspection to be carried out to address the potential</li> <li>c) fatigue stresses experienced by the crane; and</li> <li>d) The acceptance criteria adopted. The criteria shall be based</li> <li>e) on an acceptable code and standard such as British Standards 7910: "Guide on the methods of assessing the acceptability of</li> <li>f) flaws in fusion welded structures" and any other codes /</li> <li>g) standards acceptable to the Authority.</li> </ul>	<p align="center"><b>OWNER (CAN BE ASSISTED BY AE)</b></p>

<p><b>II. Inspection of mobile crane:</b></p> <p>The inspection of the mobile crane shall be conducted in a suitable testing environment and shall include but not limited to the following:</p> <ul style="list-style-type: none"> <li>a) A thorough visual inspection shall be carried out on the mobile crane/lifting machine. Critical load bearing parts such as but not limited to the boom / mast section and areas that are not accessible during the annual inspection shall be dismantled so as to facilitate inspection.</li> <li>b) Welding at critical load bearing parts (e.g. hinges) shall be inspected and any defects shall be recorded.</li> <li>c) Direct a testing agency to conduct the necessary testing such as NDT or mechanical testing.</li> </ul>	<p><b>AE</b></p>
<p><b>III. Non-Destructive Testing (NDT) and Mechanical Testing:</b></p> <p>The following load bearing parts shall be tested using an appropriate testing method to ascertain its mechanical integrity:</p> <ul style="list-style-type: none"> <li>a) Main Jib/Boom/ mast in case of forklift</li> <li>b) Fly Jib and / or other attachments; and</li> <li>c) Slew rings</li> <li>d) Hook Blocks</li> <li>e) Wire ropes / Chain in case of forklift</li> <li>f) Others</li> </ul> <p>The AE may specify other parts of the cranes to be tested if there is reason to believe that there are possible defects which can only be detected by NDT.</p>	<p><b>NDT COMPANY</b></p>
<p><b>IV. Inspection and Testing Report</b></p> <p>At the end of the inspection and testing, a report shall be prepared and shall include the following details:</p> <ul style="list-style-type: none"> <li>a) General condition of crane/ lifting machine based on the visual inspection;</li> <li>b) Location where visible defect/s was/were found;</li> <li>c) Method/s of Non-Destructive Testing used;</li> <li>d) Description of the types of flaws detected (with photographs attached)</li> <li>e) Recommend any corrective actions to be carried out on the crane/lifting machine.</li> </ul>	<p><b>TPIA</b></p>

<p><b>V. Assessment</b></p> <p>The results of the inspection and testing based on the proposed methodology and assessment carried out on the mobile crane /lifting machine shall be reviewed and if professional experience and judgment warrants it necessary, a stress analysis on critical locations of the crane shall be carried out.</p>	<p><b>TPIA</b></p>
<p><b>VI. Estimation on service life</b></p> <p>An estimation of the remaining service life for the crane based on professional experience shall be made, with the possible failure mode and mechanism stipulated in the Case Proposal.</p> <p>A proposal for inspection / maintenance scheme for the crane/lifting machine shall be made for its extended service life, so that any defects or deterioration in the crane can be detected and actions can be taken to remedy any unsafe situation before the mechanical integrity of the crane/lifting machine is affected.</p>	<p><b>TPIA</b></p>
<p><b>VII. Final Report</b></p> <p>At the end of the assessment, the crane owner is required to furnish a report to the Authority which shall provide details of the results of the Assessment and Estimation on the service life as outlined above and shall be duly endorsed by the AE.</p> <p>This final report can be used as a supporting document by the crane owner to apply to the Authority for the extension of the service life of the mobile crane.</p>	<p><b>TPIA</b></p>

Important Notes

- TPIA and NDT Company **shall be independent** of each other.

**The extended service life of the mobile crane if granted will be for a period not exceeding three (3) years.** Owner of cranes who wishes to extend the service life of his/her cranes is required to carry out additional assessments to the satisfaction of the Authority

**Annex 4 list of International Standards related to Lifting equipment**

<b>Applicability</b>	<b>International Standard</b>
Containers	ISO 10855-3 /BSEN12079-3:2006
Offshore Pedestal Cranes	API 2C, API 2D BS 7121 Part 11 BSEN 13852
Swing Jib Cranes	BS 7333:1990
Overhead Travelling Cranes	B30.16, B30.17, BS 7121-2 -7 & BS 466:1984
Mobile Cranes	BS EN 13000:2010 BS7121 Pt 1,2 & 3
Chain Blocks	BSEN 13157:2004
Rope Blocks	BSEN 13157:2004
Winches	API 2C / 2D
Fork Lift Trucks	ISO 2330
Pallet Trucks	BSEN ISO 3691-5 :2009
Lifts	EN81-20 EN81-50
Textile Slings - Flat	BS EN 1492-1: 2000
Textile Slings - Round	BS EN 1492-2:2000
Wire Rope Slings	BSEN13414-1:2003
Lifting sets for offshore containers	BSEN 12079-2:2006
Steel Wire Ropes	BSEN12385:2002

<b>Applicability</b>	<b>International Standard</b>
Lifting Components for Steel wire Rope Slings	BS EN 1677 BS EN 13411 P1-8
Short Link Chain for Lifting Purposes (Non-Calibrated medium tolerance-grade 8)	BS EN 818-2 :1996
Short Link Chain slings for Lifting Purposes (grade 8)	BS EN 818-4:1996
Chain Slings - Grade T (Fine tolerance hoist chain, Metric)	BS EN 818-7:2002
Chain Slings - Alloy steel (Imperial)	ASTM A 391
Lifting Components for Grade T 8, Chain Slings	BS EN 1677 or RR-C-271D
Shackles (Metric)	BSEN 13889
Shackles (Imperial)	RR-C-271D
Eyebolts	BS EN ISO 3266
Thimbles for Wire Rope Slings	BS EN 13411-1:2002
Rigging Screws and Turnbuckles	BS 4429:1987/ US-FED-SPEC-FF —T-791-B
Hoist or Sling Hooks	RR-C-271D, BS EN 1677
Wire Rope Grips (Metric)	BS EN 13411-5:2003
Wire Rope Grips (Imperial)	FF-C-450
Wedge Sockets	BSEN 13411-6&7
Swivels	RR-C-271D
Winches	ASME/ANSI B30.7

<b>Applicability</b>	<b>International Standard</b>
Mobile elevating work platforms operator training.	BSISO 18878
Safety rules for construction and installation lifts for the transport of persons and goods	EN81-20
Load indicator	BS7262
Vehicle Lift	BS 7980 BSEN 1493
Selection use and maintenance of personnel fall protection Systems and equipment for use in the work place	BS 8437
Safe Use of MEWPs – Code of Practice	BS 8460
Mobile elevating work platforms – Design calculations –Stability criteria – Construction – Safety –Examinations and tests	BSEN 280
Cranes – Loader cranes	BSEN 12999
Tower Crane	BSEN 14439
Cranes – Bridge and Gantry Cranes	BSEN 15011
Cranes-Requirements for container handling spreaders	BSEN 15056

Note: - The above is list of the international standards which function as guidance and not comprehensive, it is the duty of the TPIA to refer to the latest/updated version of the international standards at time of inspection.









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**SUPPORTING DOCUMENTS & REQUIREMENTS**

In order to expedite your application, please ensure that all supporting documents (as relevant) in the list below are attached along with the completed application form. The Authorised Examiner for Lifting Equipment is encouraged to create a specific folder for each of the sections below.

		<b>CHECKLIST</b>
		<input type="checkbox"/>
<b>I. SUPPORTING DOCUMENT FOR AUTHORISED EXAMINER (LIFTING EQUIPMENT)</b>		
1	Copies of Academic Qualifications, Work Experiences and any other relevant Professional Certificates i.e. LEEA, NDE, CSWIP, API, local, safety and health training, etc.	<input type="checkbox"/>
2	Copy of Relevant Safety and Health Training Certificates e.g. IOSH, NEBOSH, any local safety and health training (if any)	<input type="checkbox"/>
3	<i>Curriculum Vitae (CV)</i>	<input type="checkbox"/>
4	Copy of Passport/IC (Front and Back)	<input type="checkbox"/>
6	Copy of medical report from a registered medical practitioner (for applicants above the age of 60 years)	<input type="checkbox"/>



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Safety, Health and Environment  
National Authority

### DECLARATION

I declare that all particulars and information provided in this application and the documents attached here to are true to the best of my knowledge and belief, and I understand that the Safety, Health and Environment National Authority (SHENA) reserves the right to reject this application if, at any stage, the information provided is false and incorrect. Should verification be required on any information provided in this application, I hereby authorise SHENA to carry out the necessary investigations.

DATE

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\_\_\_\_\_  
Applicant's signature  
Name  
Designation

COMPANY STAMP

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### FOR SHENA USE ONLY

*I approve / disapprove the individual to act as approved Authorised Examiner*

REMARKS:


REF NO: SHENA / IND / 7.

DATE

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\_\_\_\_\_  
Signature  
Name  
Designation

## Annex 6 TPIA Registration Form

 <p style="font-size: small; text-align: center;">             ایٹورنری کسٹوڈین              ڈان مارکیٹر سیکشن              Safety, Health and Environment              National Authority         </p>	<p><b>APPLICATION TO ACT AS AN APPROVED THIRD-PARTY INSPECTION AGENCY (TPIA) FOR LIFTING EQUIPMENT</b></p> <p><i>Under Workplace Safety &amp; Health Order, 2009 (Section 33)</i></p>	<p>DOC NO: SHENA/IND/6.2 <b>(REV 01)</b> JAN. 2021</p>
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Only one copy of this form is to be submitted. Please complete all items in this form. Use a separate sheet to provide the information if the space provided is not sufficient. All information obtained for this application will be held in strict confidence. Incomplete submission will be automatically rejected.

<b>I.</b>	<b>APPLICANT BASIC INFORMATION (who should be responsible of maintaining Quality Assurance Manual)</b>				
This Applicant Will Be The Focal Person For Any Matters Related To Approval To Act As A THIRD-PARTY INSPECTION AGENCY For Lifting Equipment					
APPLICANT NAME					
POSITION / DESIGNATION	Quality Assurance Manager	<input type="checkbox"/>	Technical Manager	<input type="checkbox"/>	Operation Manager
CONTACT NO.					
EMAIL ADDRESS					

<b>II.</b>	<b>THIRD PARTY INSPECTION AGENCY BASIC INFORMATION</b>				
NAME OF COMPANY					
TYPE OF ORGANISATION	Partnership	<input type="checkbox"/>	Private Company	<input type="checkbox"/>	Others:
TYPE OF WORK APPLYING FOR					
REGISTERED/ MAILING ADDRESS					
ADDRESS OF HEAD OFFICE					
CONTACT NO.					
EMAIL ADDRESS					
NAME OF MANAGING DIRECTOR					
NAME OF TECHNICAL MANAGER					
CONTACT NO.					



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V. DETAILS OF PARTNERS, DIRECTORS AND KEY INSPECTION PERSONNEL								
NO OF INSPECTION PERSONNEL								
NO	FULL NAME	PASSPORT / IDENTITY CARD No. (COLOUR)	DATE OF BIRTH (XX/YY/ZZZZ)	QUALIFICATION		WORK EXPERIENCE		TYPES OF LIFTING EQUIPMENT THAT AUTHORISED EXAMINERS ARE PROPOSED TO INSPECT
				ACADEMIC	PROFESSIONAL	NAME OF COMPANY	DURATION	
1								
2								
3								
4								
5								



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VI. EXPERIENCE ON PROJECTS AND SERVICE PROVIDED OVER LAST THREE (3) YEARS					
NO	PROJECT /EQUIPMENT INSPECTED /CONTRACT AWARDED	DATE OF PROJECT/CONTRACT AWARDED /WHEN THE INSPECTION WAS CARRIED OUT	CODES /STANDARD USED	COUNTRY WHERE THE INSPECTION WAS MADE	CLIENT
1					
2					
3					
4					
5					



### SUPPORTING DOCUMENTS & REQUIREMENTS

In order to expedite your application, please ensure that all supporting documents (as relevant) in the list below are attached along with the completed application form. Third-Party Inspection Agency for Lifting Equipment is encouraged to create a specific folder for each of the sections below.

		CHECKLIST						
<b>A. BUSINESS PROFILE</b>								
1	Description of Company	<input type="checkbox"/>						
2	Company Organisation Chart	<input type="checkbox"/>						
3	Company Registration Certificates	<input type="checkbox"/>						
4	Details of Partners/Directors	<input type="checkbox"/>						
5	Company HSE Policy and Goals	<input type="checkbox"/>						
6	Types of works and services (please indicate the Codes and legislation used)	<input type="checkbox"/>						
<b>B. ACCREDITATION &amp; CERTIFICATE AWARDED</b>								
1	Accreditation or Certification granted to the organisation with full details such as Scope of the Accreditation, Certificate No. and Expiration of Certificate.	<input type="checkbox"/>						
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">ISO/IEC 17020</td> <td style="width: 33%; text-align: center;"><input type="checkbox"/></td> <td style="width: 33%;">ISO 9001</td> <td style="width: 33%; text-align: center;"><input type="checkbox"/></td> <td style="width: 33%;">LEEAA</td> <td style="width: 33%; text-align: center;"><input type="checkbox"/></td> </tr> </table>	ISO/IEC 17020	<input type="checkbox"/>	ISO 9001	<input type="checkbox"/>	LEEAA	<input type="checkbox"/>	
ISO/IEC 17020	<input type="checkbox"/>	ISO 9001	<input type="checkbox"/>	LEEAA	<input type="checkbox"/>			
	Note: ISO/ IEC 17020:2012 (Conformity Assessment Requirements for the operation of various types of bodies performing inspection) is mandatory, ISO 9001 (quality management system) and LEEAA (lifting equipment engineering association) accreditations are preferred.							
2	Copies of the approval certificates, testimonials or letters from relevant government authorities.	<input type="checkbox"/>						
3	Sample copies of Test reports Inspection reports and certificates Any technical reports.	<input type="checkbox"/>						
4	Guidelines / Process of issuance inspection Certifications e.g. legislation, code, standards	<input type="checkbox"/>						
<b>C. SUPPORTING DOCUMENT FOR INSPECTORS</b>								
1	Curriculum Vitae of Inspectors	<input type="checkbox"/>						
	Each TPIA shall have at least one or two Chief/ Senior Inspector with at least 15 years of hands-on experience within a relevant engineering discipline of which at least 10 years shall have been spent working within an engineering discipline related to lifting equipment and Inspectors at least 3 years hands-on experience spent working	<input type="checkbox"/>						
2	Copies of Academic Qualifications, Work Experiences and any other relevant Professional Certificates (for each Inspector) (e.g. LEEAA, NDE, CSWIP, API, local safety and health training, etc.)	<input type="checkbox"/>						
3	Copy of Relevant Safety and Health Training Certificates e.g. IOSH, NEBOSH, any local safety and health training (if any)	<input type="checkbox"/>						
<b>D. PROCEDURES, FACILITIES AND EQUIPMENT</b>								
1	List and photographs of facilities properly equipped with the equipment and calibrated instruments appropriate for the type and range of inspections undertaken by TPIA e.g. load cells, test weight, sheave gauges, dial gauges indicators.	<input type="checkbox"/>						



2	List of checklist forms used by inspectors to carry out a thorough examination, containing all the requirements of acceptance and rejection criteria as per relevant international standard e.g. BSEN, EN, ISO, ASME, etc.	<input type="checkbox"/>
3	List of work instruction, inspection methods and procedures for inspection to be performed.	<input type="checkbox"/>
<b>E. EMERGENCY PROCEDURES</b>		
1	Emergency Evacuation Layout Plan	<input type="checkbox"/>
2	Emergency Communication Plan	<input type="checkbox"/>
3	Photographs of Emergency Equipment (e.g. Fire Extinguisher [with inspection tag], Fire Alarm, Fire Hose Reel [if applicable], First Aid Box etc.)	<input type="checkbox"/>
4	List of fire marshal/ first aider (with certificates)	<input type="checkbox"/>
5	Insurance Cover (for premises)	<input type="checkbox"/>
6	Copy of Company HSE Induction	<input type="checkbox"/>



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 دان عالمی سیکورٹی سروسز  
 Safety, Health and Environment  
 National Authority

**DECLARATION**

I declare that all particulars and information provided in this application and the documents attached here to are true to the best of my knowledge and belief, and I understand that the Safety, Health and Environment National Authority (SHENA) reserves the right to reject this application if, at any stage, the information provided is false and incorrect. Should verification be required on any information provided in this application, I hereby authorise SHENA to carry out the necessary investigations.

DATE

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\_\_\_\_\_

Applicant's signature  
 Name  
 Designation

COMPANY STAMP

**FOR SHENA USE ONLY**

*I approve / disapprove the company to act as Third-Party Inspection Agency For Lifting Equipment.*

**REMARKS:**

REF NO: SHENA / IND / 7.

DATE

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\_\_\_\_\_

Signature  
 Name  
 Designation

**END**