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Maintenance, Inspection and Thorough Examination of Construction Hoists

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Maintenance, Inspection and Thorough Examination of Construction Hoists

CPA Good Practice Guide

Working in Partnership

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Construction Hoist Interest Group (CHIG)
Construction Plant-hire Association
27/28 Newbury St
London
EC1A 7HU
Telephone: 020 7796 3366
Email: enquiries@cpa.uk.net

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Foreword

The construction industry relies on the use of construction hoists to move materials on site. They are an essential part of the construction process and when used properly they eliminate many risks associated with access and egress and reduce manual handling. However, construction hoists must be safely installed, used and properly maintained so that they do not introduce additional risk into the overall process.

The purpose of this guidance is to help those involved with maintenance, inspection and thorough examination of construction hoists to achieve a better awareness of the processes involved and the Good Practice required to ensure that these are carried out effectively.

This guidance outlines the steps that should be taken by construction hoist owners, maintenance and inspection personnel and users in order to comply with the requirements of the law. In particular it deals with competence of maintenance personnel, key maintenance tasks, inspection and the process of thorough examination.

The guidance is straightforward, comprehensive and easy to adopt. It represents good practice.

I thank those who have been involved in its preparation and commend the guidance to anyone who own, supplies or controls the operation of construction hoists on site.

Please read the publication and turn the advice into action.

Kevin Minton
Chief Executive
Construction Plant-hire Association

1.0 Introduction and Summary

The consequences of any failure of a construction hoist are likely to be extremely serious, with the potential for multiple fatalities. Construction hoists are also often the primary means of moving materials and people on a construction site and any breakdown will have a serious effect on the construction programme. It is therefore extremely important that construction hoists are effectively maintained to ensure continued safe and efficient operation over time.

In addition to the maintenance process the thorough examination of construction hoists - after each erection, periodically and after exceptional circumstances; is required to ensure that construction hoists are safe to take into use and to continue in use.

Both the maintenance and thorough examination of construction hoists are required by law and the purpose of this Good Practice Guide (GPG) is to set out, in clear and concise terms, both the requirements and Good Practice for meeting these requirements. The document is split into two sections – Maintenance and Inspection; Thorough Examination - to emphasise that these are separate, although complimentary, activities. The document is aimed primarily at construction hoist owners, and those managing and carrying out the maintenance and thorough examination of construction hoists. However the document will also be of benefit to other groups such as construction hoist users.

Users should be aware of their duty to ensure that construction hoists are effectively maintained, inspected and thoroughly examined at appropriate intervals. They also have a duty to allow the persons carrying out these activities adequate time to complete these tasks.

This document covers conventional construction hoists; together with scaffold hoists, trestle/beam hoists and inclined hoists which are dealt with in **Annex 12.**

1.1 *Maintenance*

The maintenance of work equipment is a fundamental requirement of the *Provision and Use of Work Equipment Regulations 1998* (PUWER). Regulation 5 of PUWER requires employers to ensure that construction hoists are maintained in an efficient state, in efficient working order and in good repair. In the case of a construction hoist, the actual undertaking of maintenance is often delegated to the hoist owner by the user. The user however retains the legal responsibility for ensuring that maintenance is carried out.

There are a number of equipment maintenance management techniques that can be employed, including *"Breakdown Maintenance"* - where maintenance is only carried out after faults or failures have occurred - and *"Planned Preventive Maintenance"* - which involves routine inspection replacing parts and consumables or making necessary adjustments at pre-set intervals, so that risks do not occur as a result of the deterioration or failure of the equipment.

In the case of construction hoists, the *"Breakdown"* approach is inappropriate as any failure presents an immediate risk. The Good Practice Guidance is therefore based on the *"Planned Preventive Maintenance"* management technique.

Maintenance of construction hoists should be managed in the same way as any other business activity as it, if not carried out effectively, can have severe financial and safety implications for a business. An effective management structure is required to ensure that everyone involved in the maintenance activity is aware of their responsibilities, properly briefed on their duties and that systems are in place to enable effective feedback, including the monitoring of maintenance data.

Construction hoist maintenance activities should be carried out, as a minimum, at the intervals specified in the construction hoist manufacturer's maintenance manual. Varying circumstances on site may however require the frequency to be increased.

Once a construction hoist has been erected on a site, the user of the hoist has a duty to ensure that it is adequately maintained. The actual undertaking of the maintenance is often delegated to the hoist owner by the user. The user however retains the responsibility for ensuring that the maintenance is carried out.

Clear lines of responsibility for maintenance operations should be established from Board level downwards, ensuring that those appointed and responsible have sufficient knowledge, training and experience to carry out their duties in a way which will ensure that risks are properly controlled.

Each construction hoist should have a documented preventive maintenance schedule which is targeted at the parts of the equipment where failure or deterioration could lead to health and safety risks. This should specify the frequency of inspection and test of relevant parts, taking account of the manufacturer's instructions, the age of the hoist and its in-use history.

Construction hoist owners may not have access to expert professional engineering advice in-house. If this is the case, arrangements should be made for securing such advice externally, where this is necessary, for the purposes of health and safety and clear guidelines should be established for when this advice should be sought.

For a preventive maintenance system to be fully effective, it is essential that comprehensive records of daily checks, intermediate inspections, breakdown reports, maintenance work sheets (including details of parts replacement) and reports of thorough examination are kept. These should be filed in an individual machine history file which should be kept for the life of the hoist.

An extremely important aspect of a planned preventive maintenance system is the continuous and systematic review of all maintenance records, inspection reports and reports of thorough examination to ensure that the maintenance is effective, defects are found and worn components are replaced well in advance of any possible failure. Should this review indicate that maintenance is not fully effective, the frequency may have to be increased and maintenance practices amended.

Maintenance should only be carried out by those who are competent and have adequate training and information to carry out the work required. A number of general maintenance training courses and qualifications are available for personnel carrying out and supervising maintenance operations. Training is offered by a number of training providers, whilst qualifications are available through the NVQ/SVQ scheme.

All maintenance personnel should have received machine specific training, traceable to the construction hoist manufacturer, before carrying out maintenance tasks on any construction hoist.

Maintenance operations on construction hoists require adequate facilities and equipment to enable them to be carried out effectively, efficiently and safely. The size and sophistication of the facilities will depend on the degree of maintenance tasks to be carried out.

1.2 *Thorough Examination*

Thorough examination of lifting equipment is a fundamental requirement of the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER).

Regulation 9 of the *Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)* requires employers to ensure that construction hoists are thoroughly examined prior to use, periodically and after the occurrence of exceptional circumstances. In the case of a hired-in construction hoist, the actual undertaking of thorough examinations is often delegated to the construction hoist owner by the user.

The user however retains the legal responsibility for ensuring that thorough examinations are carried out.

The primary purpose of a thorough examination is to ensure that a construction hoist is safe to be taken into, or to continue being in, use. It is in addition to any inspection carried out as a part of the maintenance regime and is a statutory requirement.

Construction hoists operate in a high risk environment which may include lifting people, with the operator controlling the hoist from inside the cage. These factors must be taken into account by the competent person when determining the scope and nature of the thorough examination.

As with maintenance, the thorough examination of construction hoists should be managed effectively, irrespective of whether thorough examinations are carried out in-house or by a third party. An effective management structure is required to ensure that everyone involved in the thorough examination activity is aware of their responsibilities, properly briefed on their duties and that systems are in place to enable effective feedback, including the monitoring of thorough examination outcomes.

If a thorough examination is carried out by the organisation owning or supplying the construction hoist, steps must be taken to ensure that the competent persons carrying out the thorough examinations have, as LOLER requires "*the genuine authority and independence to ensure that examinations are properly carried out and that the necessary recommendations arising from them are made without fear or favour."* This guidance describes a number of ways in which this requirement may be met.

Thorough examinations of construction hoists should only be carried out by those who are assessed as competent and have adequate training and information to carry out the task. Competent persons should be selected through a formally documented assessment process and any shortfalls in their knowledge or ability addressed through formal or on the job training.

All assessment and training must be recorded in an individual training record, together with the ongoing Continuing Professional Development that should be undertaken by all Competent Persons.

Competent Persons carrying out thorough examinations of construction hoists should be provided with adequate information to enable them to carry out their duties effectively and safely. The Competent Person may specify supplementary tests to be carried out prior to or during the thorough examination. These may include tests such as:

- Overload test following erection;
- Functional test and confirmation of calibration of load limiting device;
- Safety Device drop test;
- Pre-delivery inspections;
- Non Destructive Examination of individual components.

The results of the thorough examination must be reported in writing as required by LOLER. This includes the reporting of safety critical defects to the Enforcing Authority (Normally the Health and Safety Executive).

1.3 *Availability of Construction hoists for Maintenance and Thorough Examination*

Construction hoists, when erected on a construction site, are often pivotal to the construction process and Site Managers may be reluctant to release a construction hoist to the owner to allow maintenance or thorough examination to take place.

It is essential that adequate downtime is built into the construction programme to allow effective maintenance and thorough examinations to be carried out and to ensure that personnel do not feel under pressure to cut corners. The activities should always be carried out during the hours of daylight.

1.4 *Other Issues*

In addition to the issues summarised above, the guidance also addresses factors such as site issues, management review of records, spare parts, work at height, safe systems of work and checklists for checks and inspections.

This Guidance may be used by Principal Contractors when undertaking vendor assessment as required by the CDM Regulations.

2.0 Legal Requirements

2.1 *Introduction*

The law places duties on persons concerned with construction hoists including those who supply, install and maintain construction hoists for use; those who undertake thorough examinations and those involved with the use of construction hoists for lifting operations. This section outlines those legal duties and points the reader towards further relevant guidance material.

2.2 *The Law Outlined*

Legislation relating to the use of construction hoists at work includes the:

- Health & Safety at Work etc Act 1974;
- Management of Health & Safety at Work Regulations 1999/SI3242;
- Workplace (Health, Safety & Welfare) Regulations 1992/SI3004;
- Provision & Use of Work Equipment Regulations 1998/SI2306;
- Lifting Operations & Lifting Equipment Regulations 1998/SI2307;
- Personal Protective Equipment at Work Regulations 1992/SI2966;
- Work at Height Regulations 2005/SI735;
- Supply of Machinery (Safety) Regulations 2008/SI1597;
- The Construction (Design and Management) Regulations 2015/SI51;
- The Electricity at Work Regulations 1989 (EAWR);
- The Working Time Regulations 1998.

2.3 *Health & Safety at Work etc Act 1974 (HSWA)*

HSWA places a duty on employers to ensure the health and safety of employees and others who may be affected by their work activities. Similar duties are placed on the self-employed and persons in control of premises. Employees, managers and directors also have responsibilities. The HSWA also places a duty on construction hoist owners and users, where their work activity involves construction hoists being used where they could affect the general public.

2.4 *Management of Health & Safety at Work Regulations 1999 (MHSWR)*

Under MHSWR, employers and self-employed people are required to assess risks to health and safety from their undertaking. This includes risks from the use, repair and examination of construction hoists on their premises, including the operation of the construction hoist. The risk assessment should identify what measures are needed to comply with health and safety requirements and control risk. The duty holder should then put in place the organisation and arrangements to ensure that those measures are properly implemented.

2.5 *The Workplace (Health, Safety & Welfare) Regulations 1992 (WPR)*

WPR places duties on employers to ensure, as far as is reasonably practicable, that their work places are safe and without risks to health. The WPR cover matters such as ventilation, temperature, lighting, electromagnetic radiation and cleanliness of the workplace as well as certain basic welfare provisions.

2.6 *The Provision & Use of Work Equipment Regulations 1998 (PUWER)*

PUWER is concerned with such matters as safeguarding of dangerous parts of machinery, provision of appropriate controls, and maintenance of work equipment including construction hoists.

PUWER places duties on any person who has control to any extent of:

- work equipment;
- a person at work who uses, supervises or manages the use of work equipment; or
- the way in which work equipment is used at work (including maintenance).

PUWER applies to employers in respect of work equipment provided for, or used by, their employees, self-employed persons in respect of work equipment they use and other persons, e.g. visitors.

2.7 *The Lifting Operations & Lifting Equipment Regulations 1998 (LOLER)*

LOLER deals with the specific risks arising from the use of work equipment (including lifting accessories) to lift loads. It builds upon PUWER and applies to the same groups of people. LOLER also introduces particular requirements for lifting equipment which is used to lift people, and a requirement for the thorough examination and reporting of defects found during the thorough examination of construction hoists.

2.8 *Personal Protective Equipment at Work Regulations 1992 (PPE)*

These Regulations impose health and safety requirements for the provision of, and use by, persons at work of personal protective equipment. The Regulations require employers to ensure suitable personal protective equipment is provided, without charge, for their employees and also require self-employed persons to ensure suitable personal protective equipment is provided for them. Requirements are also imposed on employees and self-employed persons for the use, storage and maintenance of personal protective equipment. Employees are also required to report to their employer the loss of or any obvious defect in personal protective equipment.

2.9 *Work at Height Regulations 2005 (WAH)*

The Work at Height Regulations impose health and safety requirements for work at height. These include:

- organisation and planning;
- hierarchy of control;
- competence and supervision;
- steps to be taken to avoid risk from work at height;
- selection of work equipment;
- inspection of work equipment.

The Regulations define work at height as:

(a) work in any place, including a place at or below ground level;

(b) obtaining access to or egress from such place while at work, except by a staircase in a permanent workplace.

2.10 *The Construction (Design and Management) Regulations 2015 (CDM)*

The Construction (Design and Management) Regulations place duties on duty holders including clients, designers and contractors in respect of the planning, management and monitoring of health, safety and welfare in construction projects and of the co-ordination of the performance of these duties by duty holders. These include a duty on every person working under the control of another to report anything that is likely to endanger health or safety. The Regulations impose additional duties on clients, designers and contractors where the project is notifiable. A project is notifiable if the construction work on a construction site is scheduled to:

a) last longer than 30 working days and have more than 20 workers working simultaneously at any point in the project; or

b) exceed 500 person days.

2.11 *British, European and ISO Standards*

Standards do not generally have the force of law: the application of a standard is almost always voluntary, although standards are very often used in support of legislation. Compliance with a standard is sometimes quoted in legislation as offering a route to discharging legal obligations.

British standards are generally restricted to Codes of Practice for safe use of equipment e.g. BS7212:2016 Code of practice for the s*afe use of construction hoists*, whilst European (EN) standards cover requirements for basic principles (Type A), common product requirements (Type B) and specific product requirements (Type C) e.g. EN12158-1:2000+A1:2010 – *Builders hoists for goods – Part 1: Hoists with accessible platforms*

International Standards (ISO) cover both the safe use and specification of lifts and components. They do not have any legal status but are often taken as good practice and are cited as normative references in some EN product standards.

3.0 Approaches to Maintenance

3.1 *Maintenance System Elements*

The introduction to this Good Practice Guide has emphasised the need to ensure that equipment is maintained, as required by PUWER, so that its performance does not deteriorate to the extent that it puts people at risk. Many people have a part to play in this, from the construction hoist operator carrying out daily and weekly checks, through the user reporting defects to the hoist owner, to the maintenance personnel responding to breakdowns and carrying out routine maintenance on the hoist. Adequate maintenance can only be achieved by establishing an effective maintenance management system which should include:

- A statement of maintenance policy (e.g. Planned Preventive Maintenance, backed up by breakdown repairs and supplemented by Predictive Maintenance or in combination);
- Definition of roles and responsibilities of persons involved in the maintenance activities;
- Systems for the assessment of individual competencies;
- A maintenance plan/schedule;
- Written maintenance procedures;
- Maintenance records;
- A review and audit plan to ensure that the maintenance is suitable and sufficient.

3.2 *Types of Maintenance Management*

There are three main types of maintenance management that may be applied to the maintenance of machines, including construction hoists and are 1) breakdown maintenance 2) preventive maintenance and 3) predictive maintenance. Not all of these are appropriate for the effective maintenance of construction hoists, as explained below.

3.3 *Breakdown Maintenance*

Breakdown or “run-to-failure” maintenance management has a simple and straightforward logic; *“If it ain’t broke, don’t fix it”* is often seen as a way of limiting expenditure on maintenance and keeping costs low. The problem with this approach for construction hoists is that any failure could present an immediate and unacceptable risk. Additionally, repair costs may well be very high when the machine does break down, often at the most inconvenient moment, with considerable downtime whilst repairs are carried out.

3.4 *Planned Preventive Maintenance*

All planned preventive maintenance systems are time driven e.g. maintenance tasks are carried out at intervals that are based on actual hours of operation or on an interval of time that equates to an average number of operating hours. The maintenance interval is based on experience of breakdowns or the mean-time to failure (MTTF) as illustrated in **Figure 1**.

The MTTF or bathtub curve indicates that a newly installed machine has a higher probability of breakdown due to installation problems in the first few weeks of operation. Following this initial period, the probability of failure is relatively low for an extended period until wear and deterioration means that the probability of breakdown/failure increases sharply with elapsed time.

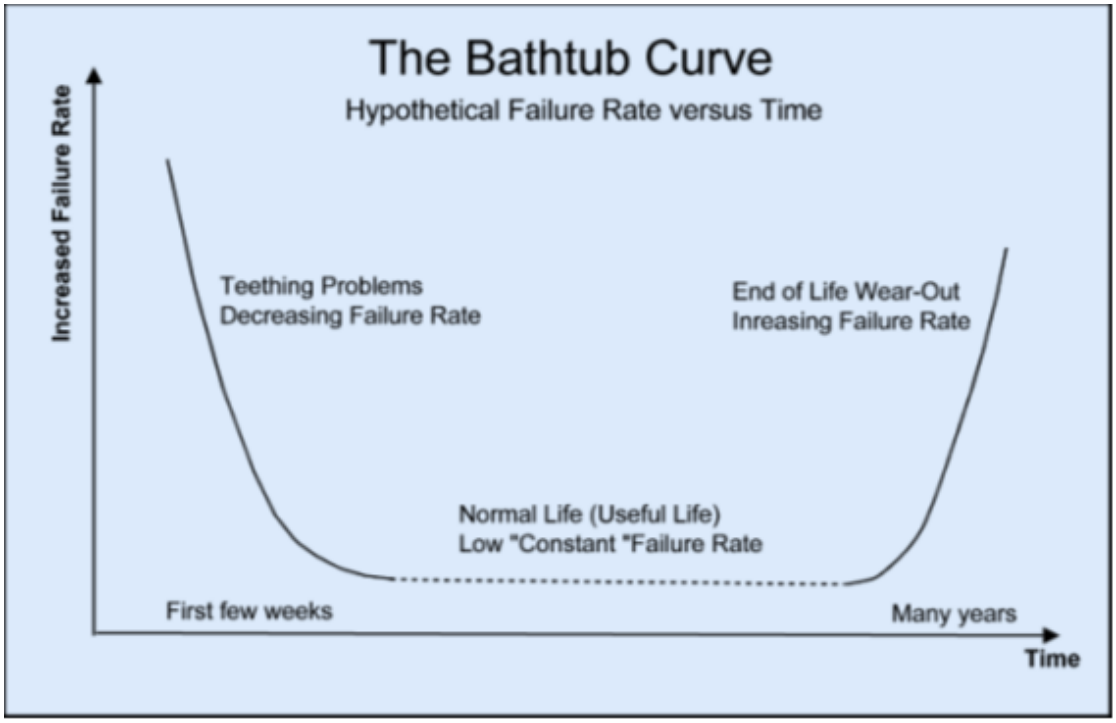

Figure 1. - The Bathtub Curve

The problem with this approach is that machines wear at different rates over time depending on variety of factors such as environment, frequency of use and load spectrum. If maintenance intervals are too great, the machine may breakdown anyway and if they are too short, maintenance costs may be unnecessarily high. Inappropriate or poor maintenance can also cause breakdowns.

3.5 *Predictive Maintenance*

Predictive maintenance is a condition-driven preventive maintenance approach which instead of relying on industry average life statistics (i.e. mean time to failure) to determine maintenance intervals, uses direct monitoring of the machine. This may include mechanical and electrical condition, environmental factors and other indicators such as frequency of use and load spectrum. These are used to determine the actual mean time to failure for the individual machine and achieve the best balance between low maintenance costs and unplanned failures.

3.6 *Good Practice Maintenance Regime for Construction Hoists*

In the case of construction hoists, reliance on the “Breakdown” approach is totally inadequate as any failure presents an immediate safety risk, whilst at the current stage of construction hoist technology, a total “Predictive Maintenance” system would be difficult to implement.

Current good practice is therefore “Planned Preventive Maintenance” backed up by repairs following breakdown. This involves replacing parts and consumables or making necessary adjustments, at pre-set intervals so that risks do not occur as a result of the deterioration or failure of the equipment. Some elements of Preventive Maintenance, such as oil sampling and use of data logging records, may well be able to be incorporated into the maintenance regime.

3.7 *Investigation of Excessive Wear or Failure*

Where maintenance activities identify excessive, unexpected or unusual wear, or failure of a construction hoist component, this must be fully investigated and a solution sought.

This may well require engineering assessment, involve the manufacturer and must be fully documented. The documentation must be presented to the competent person at the time of the next thorough examination.

3.8 *Management Structure*

Maintenance of construction hoists should be managed in the same way as any other business activity as if not carried out effectively, it can have severe financial and safety implications for a business.

An effective management structure is required to ensure that everyone involved in the maintenance activity is aware of their responsibilities, properly briefed on their duties and that systems are in place to enable effective feedback, including the monitoring of maintenance data. A sample structure is shown in **Figure 2**.

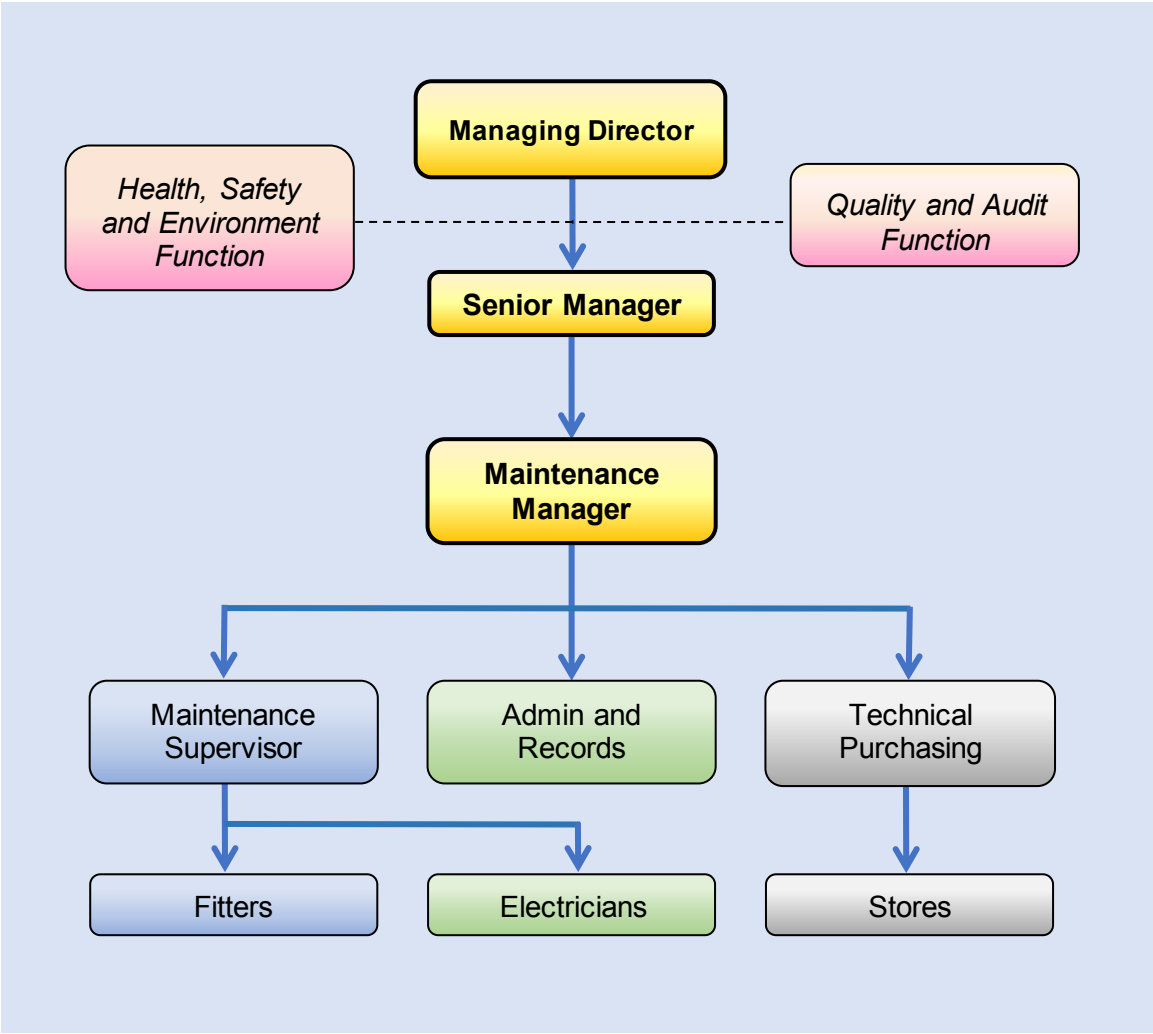

Figure 2. – Typical Maintenance Organisation

3.9 *Auditing of Maintenance Systems*

Once a maintenance system has been established, it is important that it is regularly audited to ensure that the system is being adhered to and that it is functioning correctly. Auditing should be carried out by an auditor from outside the maintenance organisation with a sufficient degree of independence.

If a business has a formal quality management system such as an ISO 9001 accredited system, the maintenance activity should be integrated into that system and the scheduled audits.

3.10 *Construction Hoist Users Responsibilities for Maintenance*

The Health and Safety at Work etc. Act 1974 sets out a general duty requiring that work equipment is maintained so that it is safe. This requirement is reinforced by Regulation 5 of the Provision and Use of Work Equipment Regulations (PUWER) 1998 which requires that "*Every employer shall ensure that work equipment is maintained in an efficient state, in efficient working order and in good repair.*"

In the case of a hired-in construction hoist, the actual undertaking of the maintenance is often delegated to the hoist owner by the user. The user however retains the legal responsibility for ensuring that the maintenance, including the rectification of defects, is carried out.

3.11 *Site Issues for Maintenance*

Maintaining a construction hoist on site presents a particular set of issues when compared with carrying out maintenance operations in a workshop or yard. These issues are best addressed at the planning stage before the hoist is erected on site and taken into use. The effective maintenance of construction hoists on site will require the cooperation of the user. An example of a document informing them of the issues they should consider when maintenance is being undertaken, is given at **Annex 4.**

Planning for work at height is of particular importance when carrying out maintenance on site and detailed guidance is given in the CPA Best Practice Guide - *Work at Height on Construction Hoists* which can be downloaded free of charge from the CPA website www.cpa.uk.net.

4.0 Maintenance Intervals

4.1 *Introduction*

It is essential that planned preventive maintenance is carried out at intervals which ensure that worn and damaged components are replaced before the construction hoist becomes unsafe, breaks down or fails. Breakdown will cause downtime and a consequent loss of production for the user, whilst a component failure may well result in a partial or total collapse of the hoist with potentially fatal consequences for persons in the vicinity of the hoist.

4.2 *Pre-delivery Maintenance and Inspection*

Before a construction hoist is delivered to site, prior to each erection or alteration, it is essential that it is inspected thoroughly to identify any worn or faulty components and that these are replaced. The results of the inspection should be recorded (See **Annex 10**). This record may be required by the competent person carrying out thorough examination of the hoist.

It is considerably easier and less costly to replace components and carry out lubrication and adjustments in a depot than when the hoist has been erected on site. Work on an erected construction hoist always involves work at height and presents difficulty in handling heavy components.

Pre-delivery maintenance provides a good opportunity for the completion of supplementary tests before the hoist is erected. It is also strongly recommended that the construction hoist's drive and control systems should be powered up and checked for correct functioning during pre-delivery maintenance.

The direct transfer of hoists between sites should be approached with extreme caution as it often leads to both delays in erection and time lost through the correction of faults. Good practice guidance is for direct transfers not to be undertaken and for hoists to be taken back to a depot for full pre-delivery maintenance before the next erection takes place.

Following delivery of the hoist components to site, the erection supervisor should verify that the pre-delivery inspection was completed at the depot prior to despatch and that the items have not been damaged in transit. He should also verify that the correct components have been delivered in accordance with the build sheet and the manufacturer's manual.

4.3 *In-service Maintenance Interval*

Once a construction hoist has been erected on site, it should be maintained at regular intervals to avoid breakdown, failure or collapse. The frequency at which maintenance is carried out should be based on the recommendations contained in the manufacturer's manual for the hoist. This should however generally be taken as the maximum interval as various factors, including the following, may require the maintenance interval to be reduced:

- Usage – Double shifting, frequent lifting at or near the Rated Capacity and long travel distances may accelerate wear of all components;
- Environment – Corrosive environments such as marine or industrial sites may accelerate corrosion of structural components, fasteners and wire ropes;
- Feedback – Feedback from maintenance records and Thorough Examination reports may indicate accelerated rates of wear and deterioration.

Once established, the current maintenance interval should be recorded in the machine history file. Any variation from the manufacture's recommended intervals must be recorded and justified each time a change is made.

4.4 *Alteration or Dismantle Pre-Inspection*

Before an erected construction hoist is altered or dismantled, it should be inspected to ensure that there are no defects which could affect the safety of the alteration or dismantling operation. Any defects found during such an inspection should be recorded for inclusion in the machine history file. The details of these defects, together with any corrective actions, must be presented to the competent person at the time of the next thorough examination.

4.5 *Second-hand Construction hoists*

When purchasing second-hand construction hoists, their condition should be thoroughly assessed as nothing can be taken for granted. Where possible, this assessment should include a review of maintenance records and previous reports of thorough examination.

Once the hoist's condition has been fully assessed and any necessary repairs have been carried out, an appropriate in-service maintenance interval should be established (See **4.3**)

5.0 Maintenance Personnel - Attributes, Training and Assessment

5.1 *Introduction*

It is essential that the maintenance of construction hoists is always carried out by personnel who have been assessed by their employer as competent and have adequate training and information to carry out the work required.

5.2 *Attributes*

Maintenance personnel should be:

- Physically fit;
- Comfortable working at height;
- Required to have a responsible attitude;
- Able to communicate clearly with other personnel on site;
- Aware of their own limitations in knowledge and experience;
- Fully conversant with the machinery they are required to maintain and its hazards;
- Properly instructed and trained. Where special machinery is involved this should include attending appropriate courses given by the manufacturer/supplier of the equipment;
- Familiar with the procedures and precautions required for safe work at height;
- Fully conversant with the appropriate sections of the manufacturer's instruction manual;
- Familiar with the use of permit to work systems, where they are required by the safe system of work and able to operate them correctly;
- Familiar with working on construction sites and site specific safety requirements;
- Aware of their responsibilities under the Health and Safety at Work Act and supporting regulations;
- Trained and competent in the pre use inspection, correct wearing and limitations of their personal protective equipment.

5.3 *Training*

All construction hoist maintenance personnel should be trained in a set of basic skills to enable them to work safely on site and participate effectively in the maintenance process. They should not be required to undertake tasks for which they have not been trained or assessed as competent to carry out. These basic skills should include the following:

- Understanding basic health and safety requirements, including the risk assessment process, together with need for site specific safety;
- Slinging and signalling;
- Tool skills, including the selection and use of tools;
- Identification, selection and fitting of fasteners;
- Use, inspection and maintenance of fall protection equipment (working at height);
- Interpretation and application of technical information, use of manuals;
- Basic assessment of weather conditions;

- Product familiarity on all makes and models of hoist on which maintenance is being carried out;
- Preparing equipment for use including isolation of power sources etc;
- Effective communication including the use and care of radio equipment;
- Carrying out basic adjustments;
- Identifying and rectifying basic faults in equipment;
- Assisting with examinations and testing.

These basic skills can be augmented by the following as required:

- Wire rope inspection and termination;
- Use of specialist tools and equipment appropriate to the work being carried out (including torque wrenches, multipliers and hydraulic tensioning equipment);
- Setting limits, including RCI/RCL and Safety Devices;
- Downloading data from data acquisition systems;
- Functional testing;
- Carrying out complex adjustments;
- Identifying and rectifying complex faults in equipment;
- Identifying proximity hazards;
- Welding and repair techniques.

5.4 *Training Plan*

An individual training plan should be drawn up for each person carrying out maintenance on construction hoists. This plan should take into account previous experience, qualifications and underpinning knowledge. Particular care should be taken where trainees fall into the category of Young Persons. Persons undergoing training should be closely supervised, where appropriate.

Achievement of this plan and continuing professional development should be monitored at frequent intervals as part of the management review process (See **Section 9**) and included in the quality system (e.g. ISO 9001) auditing process.

The plan could include elements from the Construction Hoist Installation Training Programme, TPH 01 developed jointly by the Construction Plant–hire Association, the Construction Confederation, Construction Industry Training Board and the HSE.

5.5 *Ongoing Development (Continuing Professional Development)*

Ongoing development is the conscious updating of technical knowledge and the improvement of a maintenance person's skill throughout their working life. This is a joint responsibility between the maintenance person and their employer.

The employer should maintain a training, experience and development record for each maintenance person.

The Record should include details of how ongoing development is being achieved and should include for example:

- Initial training (See **5.8** Training Records);
- Specific training towards enhancements/additions to skills;
- Familiarisation/re-familiarisation, coaching and training;

- Changes in legislation and working practices;
- Updating of product knowledge;
- Attendance at seminars and any refresher training courses.

5.6 *Manufacturer's Technical Product Training*

Before carrying out maintenance on a specific make and model of construction hoist, where a trained supervisor is not present, all maintenance personnel must receive technical training from the hoist manufacturer. If direct training by the manufacturer is not available, training may be carried out in-house. In this case, training must be carried out by a trainer who has received model specific technical training directly from the manufacturer. This ensures that the source of such training is only once removed from the manufacturer.

In the situation where the manufacturer no longer exists, a careful selection of alternative training providers will be required.

5.7 *Qualifications and Assessment*

It is important that all maintenance personnel are regularly assessed to ensure that they can carry out their duties safely and effectively. An in-house assessment should be undertaken of all maintenance personnel on appointment and at regular intervals thereafter. Assessment should form part of any training.

National or Scottish Vocational Qualifications (NVQ/SVQ) are available for both construction hoist erection (including maintenance) and construction plant maintenance.

***NOTE**: Training assessment tools are given in the Construction Hoist Installation Training Programme, THP 01.*

5.8 *Training Records*

A comprehensive individual training record should be established for all maintenance personnel. This should be updated as training is undertaken and as a minimum should include:

- When the training took place;
- Where the training took place;
- The scope of the training;
- The duration of the training;
- Who delivered the training;
- The result of any assessment;
- When refresher training is required.

5.9 *Medical Fitness*

All personnel should have an adequate degree of medical fitness to enable them to carry out their duties safely.

Detailed guidance on medical fitness is given in *Medical Fitness to Operate Construction Plant - Good Practice Guide*. Strategic Forum for Construction - Plant Safety Group (free download from www.cpa.uk.net).

6.0 Information for Maintenance

6.1 *Introduction*

The wide variation of designs and the increasing complexity of construction hoist technology make it essential that all maintenance personnel are supplied with adequate information to enable them to carry out their duties effectively and safely. Maintenance information comes in various forms and from several sources.

Construction hoist owners must ensure that a robust system is in place to provide adequate up to date information to maintenance personnel. This may be achieved in a number of ways including:

- Provision of paper manuals using a system which will ensure frequent updating is taking place;
- Provision of electronic manuals using a system which will ensure frequent updating is taking place;
- A central technical information function which can be contacted for up to date information whenever maintenance is taking place.

NOTE: *It is essential that a system is in place to ensure that manual updates, safety alerts and other information are communicated speedily to those who need to know.*

6.2 *Manufacturer's Information*

Information supplied by the construction hoist manufacturer will be the main source of instructions and specifications when carrying out maintenance. The primary document will be the maintenance manual for the specific hoist model (and in some cases serial number), supplemented by technical information bulletins.

Care should be taken to ensure that the information is up to date and relevant to the hoist on which maintenance is being carried out.

Manufacture's manuals are not always complete and in the case where a particular task is not covered, the manufacturer must be contacted for information **BEFORE** the task is undertaken.

6.3 *In-House Technical Information*

Some construction hoist owners will have their own technical information dealing with specific issues relating to the hoists in their fleet. This can be a useful source of information for maintenance personnel but care should be taken to ensure that information is current and obsolete data has been withdrawn.

6.4 *Method Statements and Work Instructions*

Much maintenance work on construction hoists is of a routine nature and can be covered by generic risk assessments, method statements and work instructions. On occasions however, unusual and potentially hazardous tasks, such as hoist winch replacement on an erected hoist, will have to be undertaken.

Such tasks must be planned thoroughly and a job specific safe system of work put in place. This planning must include consideration of falling object hazards (hand tools, components etc.).

This system of work should be described in a brief, focused job specific method statement on which all members of the maintenance team undertaking the task must be fully briefed. This briefing, which should be recorded, should concentrate on the task to be undertaken and highlight any unusual features of the job.

6.5 *Generic Information*

Maintenance personnel may also need to refer to generic information such as standards and industry guidance. For example, for wire ropes there are BS ISO 4309: *Cranes – Wire Ropes – Care, maintenance, installation, examination and discard,* and wire rope manufacturer's literature (See **Bibliography**).

Care should be taken to ensure that the information is up to date.

6.6 *Machine History*

The history of the repairs and maintenance carried out on a construction hoist is often very helpful when trying to diagnose faults and repeated failures. Maintenance personnel should be encouraged to contact their manager or supervisor to request relevant machine history details when appropriate.

6.7 *Information Formats*

Paper information such as manuals and bulletins is rapidly being replaced by electronic formats and website downloads. This has the advantage that physical storage space is kept to a minimum and, in the case of website downloads; information should be up to date at the point of access. However the use of electronic display devices, such as laptop computers or tablets, during maintenance is not always easy or practical. Information may therefore have to be printed out for use on site, in which case care should be taken that for any subsequent use the data is still current and relevant.

6.8 *Management of Information*

Information should be managed effectively if it is to be of maximum benefit to those involved in the maintenance process. Outdated information can at best, wasted time and at worst, may well affect safety. It is therefore essential that organisations carrying out maintenance on construction hoists ensure that they have robust systems and procedures to ensure that maintenance personnel are supplied with adequate information that is both up to date and accurate. The hoist manufacturer should be consulted to ensure that information is current.

7.0 Inspection During Maintenance

7.1 *Introduction*

Inspection forms a very important part of the maintenance process and is required by the Health and Safety at Work Act (Regulation 2 (2) (a)); PUWER (Regulation 6) and LOLER (Regulation 9 (3) (b)).

The Guidance on Regulation 9 (3) (b) of LOLER states that:

'You should arrange for suitable inspections to be carried out where the lifting equipment is of a type where its safe operation is dependent on its condition in use and deterioration would lead to significant risks to the operator or other persons. In determining the suitability and scope of the inspection, you should refer to available information such as the manufacturer's instructions. Examples of conditions which can be detected by inspection of the lifting equipment include:

(a) rapid wear arising from use in an arduous environment, e.g. construction;

(b) failure through repeated operation, e.g. [of a hoist winch brake];

(c) malfunction, e.g. of a rated capacity indicator; and

(d) tampering with safety devices, e.g. [overriding a trap door limit].'

7.2 *Inspection Intervals*

In-Service inspections of construction hoists are normally of four types:

Daily Pre-use Checks	Normally carried out by the construction hoist operator who should have been trained and assessed to carry out this task. Any defects found should be reported to the site appointed person and recorded.
Weekly Inspection	Carried out by a suitably trained and competent person approved by the site appointed person.
In-Service Maintenance Inspection	Normally carried out by maintenance personnel as part of the maintenance process (See **4.3**).
Intermediate Inspection	An additional inspection required to monitor deterioration of a frequently failing or suspect component.

These checks and inspections should only be carried out by personnel who have been adequately trained and assessed as competent to carry out the required tasks. It is recommended that the results of all checks and inspections are recorded in writing to ensure that that the requirements of LOLER and PUWER are met.

7.3 *Reporting of Defects*

It is essential that any defects found during checks and inspections are recorded and reported to the hoist owner. Where defects that could affect the safety of persons and require immediate rectification are found, the user of the hoist must also be informed to ensure that the hoist is taken out of service until the defect has been rectified.

7.4 *Use of Checklists*

The use of check lists is extremely useful when carrying out inspections, both as a reminder of the items to be checked and as a means of recording the results of the inspection.

When inspections are being carried out as part of maintenance, it is important that maintenance personnel do not succumb to the temptation not to record faults that are then rectified as part of the maintenance process.

This masking of faults invalidates the machine history and hinders the review process (See Section **9**). Examples of daily check and weekly inspection checklists are given at **Annex 6 & 7.** An example of a typical in-service maintenance checklist is given at **Annex 5.** These checklists should only be taken as a general guide and may well need additions for specific models of construction hoist.

7.5 *Clearance of Defects*

It is important that defects identified during checks and inspections are rectified before they can affect the safety of persons. It is helpful to categorise defects as follows:

- defects affecting the safety of persons that are to be remedied immediately;
- defects that are to be remedied prior to the next maintenance activity;
- defects that are to be remedied prior to the next thorough examination.

The rectification of all defects identified must be recorded as evidence that the work has been carried out.

NOTE: *There is a need for sites to allocate time for routine inspection and maintenance. It is unreasonable for a site to expect this work to be undertaken overnight, in darkness, or always at weekends. Time needs to be built into normal working hours for this work. (See **Annex 4**)*

8.0 Maintenance Records

8.1 *Introduction*

Comprehensive maintenance records are essential to the safe, efficient and economical operation of construction hoists. They provide a complete “cradle to grave” history of the individual hoist giving the following benefits:

- proof of adequate maintenance as part of the management system;
- establishing breakdown trends over time and informing the review of maintenance frequency;
- identification of component failure trends for feedback to the manufacturer;
- proof of adequate maintenance to the Enforcing Authorities in the event of an incident;
- enabling the performance of the hoist to be reviewed over time to inform future purchases.

8.2 *Maintenance Record Format*

Maintenance records can be kept in either paper or electronic format. Paper records are often easier to update as the input will often be in paper format such as inspection reports or work sheets. Electronic records are however more secure against loss and damage, and the data is more readily analysed. There are many maintenance record software packages on the market but care should be taken when considering purchase to ensure that the system is flexible enough to accommodate changes in types of input and output.

8.3 *Machine History Files*

Each construction hoist should have its own machine history file, in either paper or electronic format, in which all records of maintenance activities are kept by the construction hoist owner. These should include (where applicable):

- EC Declaration of Conformity;
- Pre-delivery inspections;
- Service reports and worksheets;
- Breakdown reports and worksheets;
- Daily and weekly inspection reports;
- Records of component replacement;
- Records of major overhaul;
- Erection, alteration and dismantle records;
- Test reports;
- Wire rope test certificates;
- Thorough Examination reports;
- Records of defect rectification;
- Data logger records;
- Records of supplementary tests;
- Record of modifications and upgrades;
- Safety Alerts from manufacturers;
- Records of extraordinary events.

In order to demonstrate compliance with the user's responsibility (PUWER Reg. 5) to ensure that maintenance is suitable and sufficient, a site specific machine history file should also be kept on job site by the user to record all maintenance activities carried out on the hoist whilst it is erected on that site. This file should include (where applicable):

- Service reports and worksheets;
- Breakdown reports and worksheets including records of defect rectification, component replacement and work completed following extraordinary events;
- Daily and weekly inspection reports;
- Erection, and alteration records including records of modifications and upgrades;
- Thorough Examination reports and records of supplementary tests.

The records in the site machine file will be less comprehensive than those in the owner's file as they will only refer to the period during which the hoist was on that particular site. It is however important to ensure that records from the site file are duplicated in the construction hoist owner's history file to ensure that the owner's file contains a complete "cradle to grave" record of the particular hoist.

As construction hoists are essentially modular structures made up of interchangeable components – e.g. mast sections, platform/cage sections, ties, bases and gates - it is often difficult to identify what actually makes up an individual hoist with an individual serial number. Common practice in the industry is to take a hoist with a given serial number as being made up of the base frame, drive frame and platform/cage.

All other components are added to the 'hoist' as required, to make up a construction hoist of a particular configuration for erection on a specific site. As the machine history file will only refer to those components that make up the 'hoist', there is a need for a supplementary list of all the components which make up the hoist installation.

9.0 Management Review of Maintenance Records and Procedures

9.1 *Introduction*

A regular management review of construction hoist maintenance records and procedures is essential for the safe and efficient operation of a construction hoist fleet. It ensures that management can be confident that a robust maintenance system is in place and will rapidly highlight any shortcomings and the need for corrective action. The review should include:

- Checks to see that faults are being corrected and closed out appropriately and maintenance schedule is being completed to plan;
- Checks to determine if the regime and frequencies are appropriate and to analyse trends.

9.2 *Benefits*

The benefits of regular management review of maintenance records are:

- Confidence that the system is functioning correctly;
- Identification of extraordinary events and failures;
- Ensuring that there is proof of adequate maintenance to the Enforcing Authorities in the event of an incident;
- Establishing breakdown trends over time and informing the review of maintenance frequency;
- Identification of component failure trends for feedback to the manufacturer;
- Providing breakdown trends to the manufacturer to inform future designs;
- Highlighting on-site maintenance access problems for feedback to the manufacturer to improve future designs;
- Monitoring the performance of individual hoists over time to inform future purchases.

9.3 *Review Frequency*

The review should be carried out initially at least monthly. Once a suitable level of confidence in the systems has been established, the review frequency may be reduced in the light of experience.

9.4 *Review Methodology*

The review should aim to identify exceptional events such as occurrences of heavy expenditure and reoccurring faults. It should also measure achievement of maintenance activities against target.

9.5 *Review Records*

It is essential that written records of the management review are made, both as evidence that the reviews have been undertaken and to evaluate long term trends.

10.0 Spare Parts

10.1 *Introduction*

Maintenance operations on construction hoists can only be fully effective if the correct spare parts are available at the correct location in a timely manner. This can only be achieved if a robust spare parts management system is in place. Ineffective management of spare parts or the on-site "quick fix" may result in both direct and indirect costs and affect the safety of the construction hoist. Spare parts can represent a considerable capital investment and should be treated as tangible business assets.

10.2 *Availability and Sourcing*

The two extremes of spare part sourcing are to stock every spare part that could ever be required in the construction hoist owner's stores or to stock nothing, relying on the hoist manufacturer's stock with suitable methods of delivery. In practice, a combination of the two is often used, avoiding a costly inventory whilst ensuring that fast moving items are readily available.

A list of critical items with long lead times should be identified by consultation with the manufacturer. Strong consideration should be given to stocking such items to ensure minimum hoist downtime. Careful consideration should be given to storage, stock control and parts identification.

10.3 *Spare Part Specification*

Spare parts must always meet the hoist manufacturer's specification. Ensuring that this is the case is often a complex process involving a full engineering assessment of the component to be replaced and it is often easier to purchase from the hoist manufacturer. One of the benefits of purchase from the hoist manufacturer is ensuring that parts are to the latest specification.

10.4 *Safety Critical Spare Parts*

When a hoist design incorporates safety-critical assemblies of components, identifying which assembly has been inspected, maintained, or has deteriorated etc. can prove difficult to record, action or trace if the component does not have any identification marking.

Safety-critical hoist component assemblies and sub-assemblies such as drive motors, gearboxes, brakes and overspeed safety device etc. should contain unique reference markings to enable component identification and traceability throughout inspection and maintenance regimes. These individual identifiers should be traceable in any associated documentation. If they have no such identification, this needs to be remedied using permanent and indelible markings.

Hoist inspection and maintenance documentation should ensure that individual hoist components can be identified and that associated inspection and maintenance information/observations/measurements can be recorded against that component. For example, if the hoist design includes two drive motors, the inspection/maintenance document should provide the facility to record both drive motor/brake identification markings and their respective brake information/observations/measurements etc.

There also should be a system in place to ensure that where safety critical component assemblies are interchanged between hoists, that their service history is reassigned and traceable to that new hoist.

10.5 *Component Reuse and Refurbishment*

There is always a temptation to store part-worn components for reuse. This is often a false economy as these components may contain hidden defects and may fail without warning. It is also difficult to maintain any service history of such parts. Care should be taken to ensure that maintenance personnel do not accumulate a personal stock of part worn components.

Refurbishment of worn components should only be undertaken if they can be returned to the manufacturer's original specification.

Worn or failed components that have been returned to the depot for investigation following replacement must be kept in a quarantined area until authorised for disposal. Disposal should ensure that the component is scrapped in a way that ensures it cannot be reused. All other replaced components should be scrapped on replacement.

10.6 *Installation and Replacement of Spare Parts*

Spare parts must always be installed by suitably trained and competent personnel in accordance with manufacturer's instructions, otherwise there is potential for significant failures. Installation instructions should be provided by the manufacturer accompanying the spare parts and must be made available to the personnel carrying out the installation.

11.0 Maintenance Facilities and Equipment

11.1 *Introduction*

Maintenance operations on construction hoists require adequate facilities and equipment to enable them to be carried out effectively, efficiently and safely. The size and sophistication of the facilities will depend on the degree of maintenance tasks to be carried out. Suitable welfare facilities should be provided for the use of all employees and visitors.

It is essential that all refurbishment and repair of construction hoists is carried out by competent personnel who are fully briefed and supplied with adequate information, equipment and facilities.

11.2 *Workshops*

If maintenance and overhaul of mechanical and electrical components and assemblies is to be carried out successfully, an adequately-sized workshop is essential. It should be weather-resistant with adequate heating, ventilation and lighting, and provided with sufficient power, work benches and adequate storage for tools and equipment.

11.3 *Other Issues*

Consideration should be given to the following:

- Component and hoist washdown and cleaning area;
- Shot blasting facilities;
- Spray painting facilities;
- Waste disposal;
- Test area;
- Storage including hard standings;
- Craneage, loading and unloading of hoists and components;
- Fastener maintenance, storage and identification;
- Wire ropes, including storage and lubrication;
- Power, specialist and hand tools - maintenance and storage;
- Test and measuring equipment, storage and calibration.

11.4 *Welding Facilities*

Structural repairs to construction hoists will require the use of welding techniques. Welding should only be carried out by trained and competent personnel working to welding procedures approved by the construction hoist manufacturer, or following a full engineering assessment by a competent engineer.

Welding should be carried out undercover wherever possible and arrangements should be made to protect welders and other personnel from arc flashes, weld-splatter and welding fume.

Welding equipment should be regularly checked, maintained and calibrated as appropriate. Consumables should be stored in a secure and dry area.

Weld repairs should be subjected to full visual, and where appropriate, NDT inspection.

NOTE: *Further information is given in:*

- *BS EN 287-1:2017 - Qualification test of welders. Fusion welding. Steels;*
- *BS EN ISO 17637:2016 - Non-destructive testing of welds. Visual testing of fusion-welded joints;*
- *BS EN ISO 15607:2003 – Specification and qualification of welding procedures for metallic materials. General rules;*
- *British Institute of Non-destructive Testing at http://www.bindt.org.*

11.5 *Protection Against Fume*

Welding fume can cause lung cancer, asthma and many other health conditions and is subject to the Control of Substance Hazardous to Health (COSHH) regulations. The fume generated from cutting, grinding and burning activities carries a similar risk to that generated by welding and should be treated accordingly.

Information on the hazards and risks of welding, cutting and burning can be found at: https://www.hse.gov.uk/welding/protect-your-workers/index.htm

Information on local exhaust ventilation of workplace fume can be found at: http://www.hse.gov.uk/lev/

Information on COSHH precautions for welding, cutting and surface preparation is provided at:

https://www.hse.gov.uk/welding/guidance/index.htm

Information on mild steel welding fume can be found at: https://www.hse.gov.uk/safetybulletins/mild-steel-welding-fume.htm

11.6 *Repair Records*

It is essential that all work carried out as part of maintenance is recorded in the machine history file (See **8.3**).

11.7 *Compliance with Regulations*

Care should be taken to ensure that in carrying out maintenance operations all relevant regulations are complied with, including but not limited to:

- The Control of Substances Hazardous to Health Regulations 2002 (COSHH);
- The Work at Height Regulations 2005 (WAHR);
- The Electricity at Work Regulations 1989 (EAWR);
- The Working Time Regulations 1998.

12.0 Approaches to Thorough Examination

12.1 *Introduction*

The primary purpose of thorough examination is to ensure that a construction hoist is safe to be taken into use, or to continue to be used. It is in addition to any inspection carried out as a part of the maintenance regime and is a statutory requirement.

Construction hoists operate in a high risk environment which includes lifting loads above people and with the operator and passengers in an elevated position. These factors must be taken into account by the competent person when determining the scope and nature of the thorough examination.

NOTE: *The thorough examination is not part of the maintenance regime for the equipment but provides owners with information which could be used to determine the effectiveness of the regime. The competent person may require supplementary tests as part of thorough examination.*

NOTE: *The legal requirements covering thorough examination are set out in HSE publication L113 - Approved Code of Practice and Guidance to LOLER. It is essential that anyone undertaking thorough examinations of construction hoists or the management of the thorough examination of construction hoists obtains and familiarises themselves with this document.*

12.2 *Types of Thorough Examination*

There are three situations where thorough examination is required by Regulation 9 of LOLER:

- After each installation of the construction hoist and before putting into service - LOLER Regulation 9(2)(a)&(b);
- Periodically whilst in service - LOLER Regulation 9(3)(a)(i)&(ii);
- After exceptional circumstances have occurred - LOLER Regulation 9(3)(a)(iv).

NOTE: *Requirements for thorough examination of hoists and any associated testing are set out in Table 1.*

12.3 *Initial Post Installation Thorough Examination*

Once a construction hoist has been installed on a new location (site), it must be thoroughly examined by a competent person before being taken into service to ensure that it has the adequate strength and stability for its intended use and that any defects present have been identified and are rectified.

This initial thorough examination will require a high degree of scrutiny of the configuration and all relevant documentation to ensure that the construction hoist has been installed correctly and is safe to use.

If the configuration of the construction hoist is changed while it is still at a given location, e.g. a change in height or additional ties, the hoist will require further thorough examination before it is returned to service. (See **Table 1**)

12.4 *Thorough Examination Following Alteration on Site*

If the configuration of the hoist is changed whilst it is still at its new location and safety may be affected, it will need to be thoroughly examined again before being put back into use. This examination is mandatory, irrespective of any previous periodic thorough examinations (see **12.2**). The scope and nature is at the discretion of the competent person.

This thorough examination should concentrate on the integrity of those parts of the installation that have changed. For certain re-configurations, **Table 1** recommends that a load test is always carried out in accordance with **A3.12**.

The competent person is advised to look at the service history and previous thorough examination report to influence their judgement on the extent of the thorough examination.

If the scope of this examination does not cover all the elements normally included in an initial post-installation thorough examination (See **12.3)**, then it is recommended that the existing date of the next periodic thorough examination remains unchanged.

12.5 *Periodic Thorough Examination*

Once a construction hoist has been taken into service on a new site, it must be thoroughly examined periodically to ensure that it is safe to continue in use. LOLER specifies that the maximum intervals between thorough examinations are six months for construction hoists that lift people, and twelve months for construction hoists that lift goods only.

It is however good practice to set the maximum interval for all construction hoists on construction sites at six months for the following reasons:

- Construction hoists frequently work above or near people, both personnel on site and members of the public outside the site;
- The intensity of use and the environment in which they are installed.

This decision may be made by the competent person or the construction hoist owner.

12.6 *Thorough Examination Interval Reduction*

The recommended maximum interval of six months may be reduced at the discretion of the competent person and should take into account, environmental factors or the general age and condition of the hoist etc. To assist the competent person in assessing the interval, they should view the planned in-service usage information (*risk assessment, method statement and schedule of lifts*) to ascertain the likely load spectrum and frequency of use of the hoist.

12.7 *Thorough Examination After Exceptional Circumstances*

If the construction hoist is subjected to exceptional circumstances, it should be removed from service and subjected to a thorough examination to ensure that it is safe to be returned to service. Exceptional circumstances may include misuse, an overload, use for particularly arduous duties, collision, a failure of a structural component or being subjected to weather in excess of design parameters.

12.8 *Examination Schemes*

As an alternative to the maximum intervals of twelve and six months for periodic thorough examination, LOLER allows a competent person to draw up an 'examination scheme' for an item of lifting equipment such as a construction hoist.

Good practice guidance suggests that the examination scheme approach is totally unsuitable and periodic thorough examinations should be used for all construction hoists.

12.9 *Use of Construction Hoists by Scaffolders Before Completion and Thorough Examinations of the Hoist Installation*

Construction hoists are sometimes used for the transportation of scaffolding materials during the erection and dismantling of scaffolding before the hoist installation has been completed and a thorough examination has taken place. In these situations, special procedures apply. These are detailed in the CPA CHIG Guidance Document -*CHIG 0501, Transporting Scaffolding in Construction Hoists:* (https://www.cpa.uk.net/construction-hoist-interest-group/)

This practice introduces additional hazards into the use of hoists and the use of safer methods needs to be carefully considered before a hoist is used for the transportation of scaffolding materials during the erection and dismantling of scaffolding.

12.10 *Construction Hoist Users Responsibilities for Thorough Examination*

Regulation 9 of the *Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)* requires employers to ensure that construction hoists are thoroughly examined at prescribed intervals (See **12.2**). In the case of a hired-in construction hoist, the actual undertaking of thorough examinations is often delegated to the hoist owner by the user. The user however retains the legal responsibility for ensuring that thorough examinations are carried out, recorded and the records retained.

12.11 *Site Issues for Thorough Examinations*

Carrying out a thorough examination of a construction hoist on site presents a particular set of issues when compared with carrying out a thorough examination of lifting equipment, such as a mobile crane, in a workshop or yard. These issues are best addressed at the planning stage before the hoist is erected on site and taken into use. The effective thorough examination of construction hoists on site will require the cooperation of the user and an example of a document informing users of the issues they should consider when a thorough examination is being undertaken is given at **Annex 4.**

Planning for work at height is of particular importance when carrying out the thorough examination of construction hoists on site and detailed guidance is given in the CPA Best Practice Guide - *Work at Height on Construction Hoists* which can be downloaded free of charge from the CPA website at www.cpa.uk.net.

12.12 *Testing*

Testing as part of thorough examination is addressed in **Table 1** and **Annex 3.**

Table 1 - Construction Hoist Through Examination and Testing *(Derived from BS7212:2016)*

Activity		Thorough Examination	Functional Test (A3.10.0)	Load Control Test (A3.11.0)	Load Test (A3.12.0)	Drop Test (A3.13.0)	NDT (A3.15.0)	Docu-mentation
Initial and complete hoist installation		✓ (12.3)	✓	✓	100 + % [1]	100% [2]	Discretionary	Schedule 1 Report
Periodic Thorough Examination		✓ (12.5)	✓	✓	100 % [1]	100% [2]	Discretionary	Schedule 1 Report
Thoro' Exam. after exceptional circumstances, e.g. dangerous occurrences, repair of load bearing parts & major repairs		✓ (12.7)	Discretionary	Discretionary	Discretionary	Discretionary	Discretionary	Schedule 1 Report
ALTERATIONS	**Increase mast height**	✓ (12.4)	Discretionary	×	100 + % [1]	×	Discretionary	Schedule 1 Report [6]
	Reduce mast height No ties removed	✓ (12.4)	Discretionary	×	×	×	Discretionary	Schedule 1 Report [6]
	Reduce mast height Ties removed	✓ (12.4)	Discretionary	×	100 + % [1]	×	Discretionary	Schedule 1 Report [6]
	Adding gate(s)	✓ (12.4)	Discretionary	×	×	×	×	Schedule 1 Report [6]
	Removing gate(s)	✓ (12.4)	Discretionary	×	×	×	×	Schedule 1 Report [6]
	Adding ties	✓ (12.4)	Discretionary	×	100 + % [1]	×	Discretionary	Schedule 1 Report [6]
	Removing ties	✓ (12.4)	Discretionary	×	100 + % [1]	×	Discretionary	Schedule 1 Report [6]
Partial Dismantling		See notes over page. Refer to relevant activities listed above.						
Dismantling		See notes over page		×	✓[3]	✓[4]	×	×[5]

✓ = Carry out this activity. × = This activity is not required. Discretionary = This activity is at the discretion of the competent person (see sections **12.4** and **12.7**).

1 Hoists should be proof load tested in accordance with the manufacturer's instructions.

2 The load may be reduced as per the manufacturer's instructions.

3 A functional test of the hoist motor brake with a load should be carried out before dismantling.

4 A drop test should be carried out prior to dismantling. This may be with or without a load.

5 Documentation is not normally required, but if defective components are discovered, these should be noted for subsequent action.

6 Hoist configuration changes which affect safety require a thorough examination before being returned to service, (See **12.4**).

13.0 Management of Thorough Examination

13.1 *Introduction*

LOLER permits thorough examination to be carried out by competent persons from both third-party in-service inspection organisations and 'in-house' examiners. Competent persons are required to have "*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."*

It is also *"essential that the competent person is sufficiently independent and impartial to allow objective decisions to be made."*

As a general principle, this means that it is not appropriate to have a member of the erection or maintenance team carry out the thorough examination. However, there are specific circumstances where this may be the only practical option - See **Table 2**. In such case, the safeguards specified in **13.5** must be followed.

13.2 *Use of a Third-Party Inspection Body*

Many third-party inspection bodies who carry out thorough examinations of construction hoists, such as full members of the Safety Assessment Federation, will hold accreditation to ISO 17020.

In order to satisfy such accreditation requirements, the following must be included:

- Verification of an organisation's independence for the function of inspection;
- Identification and stipulation of the limiting scope of activity for the organisation (i.e. defining the inspection competencies of the organisation);
- Sufficiently documented processes and procedures (Procedural, Quality and Health & Safety) supporting the thorough examinations undertaken;
- Evidence that documentation has been periodically reviewed and relevant information provided to the competent person;
- The auditing of these processes and procedures on a periodic basis by a recognised accreditation body;
- The performance assessment, by the accreditation body, of the organisation's in-house audit schedule and that non-conformity action has been suitably completed;
- The auditing, by the accreditation body, of the competent person's training records;
- The auditing, by the accreditation body, of the thorough examinations carried out by competent persons;
- The auditing, by the accreditation body, of the reporting process to ensure that report to the enforcing authority reports are issued, as appropriate, without fear or favour and within required timescales. This audit will also include report format compliance with legislative requirements.

The benefit of a third-party inspection body is that the competent person will, by definition, be independent from all aspects of the installation and maintenance of the construction hoist. They may however not have the detailed product knowledge that an in-house competent person might possess, but they will have been comprehensively trained and assessed in thorough examination techniques and will know when to ask for product specific information.

They will look at a hoist from a different perspective than someone regularly involved in the maintenance of that type or model of hoist.

Use of a third-party body will require management input from the hoist owner and user in terms of making the construction hoist available, providing details of hoist configuration, maintenance carried out, preparation of the hoist for thorough examination, supplementary tests and management of thorough examination reports. Both parties must also be prepared to take a hoist out of service if the third-party competent person carrying out a thorough examination identifies defects which immediately affect the safety of persons.

It is essential that the construction hoist owner and the competent person, or his employer, agree and periodically review, the programme and information requirements for thorough examinations. This includes the specific supplementary test reports that will be provided prior to each thorough examination following erection and each subsequent in-service thorough examination. This is especially important when a new external provider has been appointed.

***NOTE**: The United Kingdom Accreditation Service (UKAS) is the sole UK body authorised by The Department for Business, Energy & Industrial Strategy (BEIS) to carry out accreditation to ISO 17020.*

13.3 *Carrying Out Thorough Examination In-house*

As noted above, LOLER permits the use of in-house competent persons. Their employer must, however, ensure that they "*have the genuine authority and independence to ensure that examinations are properly carried out and that the necessary recommendations arising from them are made without fear or favour.*" (HSE L113 para. 297). This can only be demonstrated by means of a clearly defined autonomous management structure with built in checks and balances to ensure that the necessary degree of independence is achieved. One means of demonstrating this is accreditation to ISO 17020.

13.4 *In-house Thorough Examination Management Structure*

If thorough examination of construction hoists is being undertaken in-house, an effective management structure should be put in place to ensure that everyone involved in the activity is aware of their responsibilities, are properly briefed on their duties and that systems are in place to demonstrate independence and enable effective feedback - including the monitoring of thorough examination. A sample structure is shown in **Fig. 3.**

A number of measures can be taken which will help establish the independence of the competent persons:

- A fully documented procedure for the carrying out of thorough examinations, detailing responsibilities and reporting hierarchy of competent persons;
- A fully documented, detailed and independently audited quality system such as ISO 9001;
- The thorough examination function reporting straight to the Managing Director or equivalent;
- An undertaking that except in specific and carefully controlled circumstances, the competent person will never examine their own installation or maintenance work;
- A statement that in the case of any conflict, the Managing Director will always back the competent person;
- The competent person has the authority to stop the operation of any construction hoist owned or operated by the company and to liaise with the user to ensure that this happens, isolating the hoist if necessary;

- The competent person has the authority to send reports of examination, where there is an imminent danger of serious personal injury, to the enforcing authority (HSE or Local Authority);
- The competent persons are not paid by results (e.g. the quantity of examinations completed).

From this, it is clear that thorough examinations, following erection, carried out by any member of the erection team (including the supervisor) may well not have the required degree of independence and that except in specific and carefully controlled circumstances, they should not carry out thorough examination of hoists where they have been directly involved in the erection or alteration process. The exceptions to this are detailed in **Table 2**.

Category	Capacity	Installation Situation	Minimum Independence Required (See **13.4** & **13.5**)
Passenger Carrying	All	Initial Installation	Third Party or Independent In-house Competent Person
	All	Alteration after period > 24 hours	Third Party or Independent In-house
	All	Alteration after period ≤ 24hours e.g. slipforming	Installation Supervisor with monitoring
Goods Carrying Only	> 500kg	Initial Installation	Third Party or Independent In-house
	> 500kg	Alteration	Third Party or Independent In-house
	500kg or less	Initial Installation	Installation Supervisor with monitoring
	500kg or less	Alteration	Installation Supervisor with monitoring

Table 2 - Independence Requirements for Thorough Examination of Construction Hoists

Thorough examinations by competent persons other than a third party or an independent in-house competent person are subject to the following provisos:

- The thorough examination must be conducted and reported on separately to other work;
- Once the competent person initiates the thorough examination, they must complete it and report on it. They must not for example, find a defect, take measures to remedy that defect, then continue the examination as though that defect had not existed. This does not mean that the competent person, if they have the necessary skill, cannot during the same visit to the equipment, repair defects. However, it does mean that such activity should be conducted separately;
- It is important that the Report of Thorough Examination provides an independent view of the equipment at the time of the examination, not a view of the equipment having just been repaired. It follows therefore that the thorough examination should be conducted first, followed by any scheduled maintenance and/or repairs. The Report of Thorough Examination should be completed immediately after the examination and before any other work is carried out;
- If defects are found during the thorough examination and the competent person is able to remedy them immediately following the examination, they may do so provided they are also a competent service engineer. However, to avoid any confusion, the thorough examination and subsequent remedial work must be reported on separately. Documentation completed must allow for this;

- Thorough Examinations carried out by competent persons, other than a third party or an independent in-house competent person, must be assessed and monitored at regular intervals by a third party or an independent in-house competent person (See **13.5**).

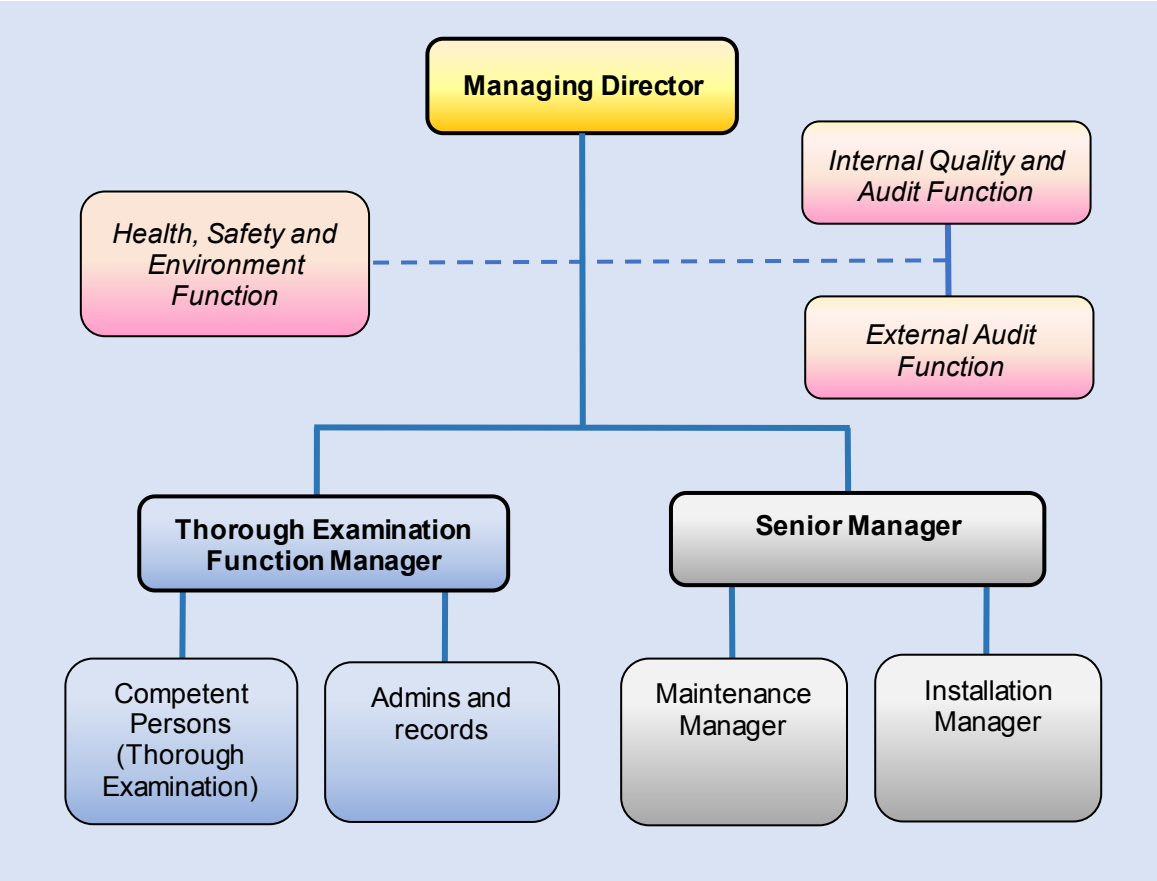

Figure 3. – Typical In-house Thorough Examination Organisation Structure

13.5 *Monitoring of Competent Persons Examining Their Own Work*

The monitoring of competent persons carrying out the thorough examination of work with which they have been directly involved should be carried out by a person (the monitor) with the necessary competence to make objective and valid judgements about the competence and independence of the competent person. The monitor may be employed by the competent person's employer or from a third party such as an external inspection body.

The monitor should meet the criteria set out in **14.0** to ensure that they have the necessary competence to carry out monitoring of the competent person.

Monitoring should involve a number of processes:

- Initial assessment of the competent person's attributes, qualifications and experience;
- Periodic review of reports of thorough examination for accuracy and completeness;
- Periodic review of maintenance and breakdown records and comparison with reports of thorough examination to identify any issues with detection of defects;

- Carrying out on-site checks of thorough examinations shortly after an examination has been carried out on the same hoist by the competent person being monitored.

The monitoring process should be recorded and an example monitoring record is shown in **Annex 11.**

Monitoring should be carried out at the intervals specified in **Table 3**. If the outcome of the monitoring process at any stage is unsatisfactory, the competent person must receive remedial training and the monitoring frequency must return to Stage 1.

Stage	***Thorough Examinations***	***Monitoring Frequency (Records)***	***Monitoring Frequency (On site)***
1.	Initial Ten TE's	Every TE	First TE and one random within the first ten
2.	Subsequent Twenty TE's	Every TE	One random within next twenty
3.	Subsequent TE's	Every TE	Six-monthly

Table 3 - Minimum Monitoring Frequencies for Thorough Examination Undertaken by the Installation Supervisor

13.6 *Auditing of In-house Thorough Examination Management Systems*

Once an in-house thorough examination system has been established, it is important that it is regularly audited to ensure that the system is being adhered to and that it is functioning correctly. Auditing should be carried out by an auditor from outside the thorough examination department with a sufficient degree of independence.

If a business has a formal quality management system such as an ISO 9001 accredited system, the thorough examination activity should be integrated into that system and the scheduled audits.

Strong consideration should also be given to obtaining UKAS accreditation to ISO 17020 as an in-service inspection body.

13.7 *Managing the Examination of Hoistway Protection*

13.7.1 Introduction

A construction hoist is essentially a modular machine, erected on site from a number of components which are adapted or adjusted for the particular circumstances of the installation. Part of the installation process is the provision of landing gates, landings, run-offs and protection of the hoistway. These arrangements serve a threefold purpose:

- prevention of persons and/or materials falling from height;
- safe access of materials and persons to and from the hoist platform/cage;
- prevention of persons being struck by any part of the moving hoist.

Depending on the type and design of hoist and the contractual arrangements between the hoist owner and user, the provision of the hoistway and its associated gates and landings is not always carried out by the hoist installer.

Current practice covers a wide spectrum. The installer may be responsible for all aspects of the hoist installation including the provision and fixing of ties, landings, gates, run-offs and hoistway protection.

In other situations, the installer provides and erects the basic hoist and leaves the user or his sub-contractors to hang landing gates, provide the landings and run-offs and ensure that the hoistway is adequately protected.

The ultimate responsibility for the management of the hoistway protection rests with the principal contractor and/or user. They should ensure that the following points form part of the planning and management process:

- The nominated contractors involved in the installation process must each be made aware of their scope of work and responsibilities. Regulation 11 of the Management of Health and Safety at Work Regulations 1999 requires these different parties to co-operate and co-ordinate their different activities;
- Any use of the hoist before the installation is complete, such as assisting in the installation of the scaffolding which forms part of the hoistway protection and the landing interface, must only be carried out by authorised and trained personnel working to a method statement based on risk assessment. LOLER only allows the use of goods-only hoists for 'man-riding' in exceptional circumstances. Reference should be made to the hoist manufacturer's instructions which may have specifically included the erection/dismantling procedure from the platform/cage;
- Once the hoist installation has been completed to the satisfaction of the installer and before the hoist is taken into normal intended use, the whole installation must be thoroughly examined by a competent person. Any defects highlighted in the examination must be rectified before the hoist is put into service;
- After the hoist has been put into service, adequate arrangements must be made to ensure that the hoist installation - including landing interfaces and hoistway protection - is maintained, inspected and thoroughly examined as detailed in the various sections of this Good Practice Guide.

The nominated contractors involved in the dismantling process must each be made aware of their scope of work and responsibilities.

13.7.2 Thorough examination of the hoistway

Once the complete hoist system of machinery, mast, ties, gates, landings, run-offs and other hoistway protection has been completed and before the hoist is taken into service, LOLER requires that a thorough examination of the whole installation is carried out by a competent person (See Section **12.2**). This competent person is often an employee or representative of the hoist owner/installer. However, the responsibility for ensuring that this thorough examination is carried out and that any defects are rectified, rests with the user.

Although the thorough examination of the hoistway protection includes establishing the presence of all elements, it is not the responsibility of the competent person carrying out the examination to verify their structural integrity, but they must satisfy themselves that there are no obvious defects. The planning, design and structural integrity of the hoistway protection and the landing interfaces remains the responsibility of the user.

For example, the threshold and landings must be able to withstand at least the rated load of the hoist. This is particularly important if pallet trucks are to be used to unload the platform as significant point loads can be transferred to the hoist floor, ramps and landings.

The design of hoistway protection may vary with every installation. Guidance on suitable solutions can be obtained from Harmonised European Standards, The CPA *Best Practice Guide on Safeguarding Requirements for Landing Gates of Goods-only Construction Hoists CHIG 0401,* (See **Bibliography**) and the hoist manufacturer.

14.0 Competent Persons – Attributes, Training and Assessment

14.1 *Introduction*

It is essential that the thorough examination of construction hoists is always carried out by competent persons who have been assessed as competent and have adequate training, information and independence to carry out the work required. They must be able to draw up a scope of thorough examination for each examination and amend the scope in the light of their findings.

14.2 *Attributes*

Competent persons carrying out the thorough examination of construction hoists should have the following attributes:

Personal Attributes

- Be physically fit;
- Be comfortable working at height;
- Have a responsible attitude;
- Be able to communicate clearly with other personnel on site;
- Be confident in exerting their authority when communicating their findings to all parties;
- Be familiar with working on construction sites and site specific safety requirements;
- Be aware of their responsibilities under the Health and Safety at Work Act and supporting regulations;
- Be trained in the use, pre-use checks and maintenance of their personal protective equipment and capable of using it correctly.

Knowledge Base

- Have an understanding of the legislative requirements for thorough examination;
- Have an understanding of the construction hoist design Standards and codes of practice for the selection and use of construction hoists, together with the applicable inspection/examination criteria;
- Have an understanding of the safety rules and associated codes of practice that are applicable to construction hoists;
- Have an understanding of the inspection and maintenance requirements of construction hoists;
- Have knowledge of appropriate test procedures which may be employed and the interpretation and limitations of those techniques;
- Have an understanding of drawings and manufacturing literature relevant to the construction hoists to be inspected or examined;
- Have knowledge of the materials and techniques used in the manufacture and assembly of the construction hoists;
- Be aware of their own limitations.

Practical Skills

- Be capable of detecting defects or weaknesses in construction hoists which could compromise the safety of the construction hoist and assess the importance of these to the continued safe operation of the hoist;
- Have adequate knowledge of the manufacturer's requirements for the correct installation of the hoist to be thoroughly examined, to enable them to assess the adequacy of the installation;
- Have sufficient knowledge and experience to assess the importance of defects or weaknesses in the construction hoist and identifying what actions need to be taken in order to rectify them. In particular they should be able to:
    - verify that the construction hoist is operating as intended;
    - specify the appropriate time-scales within which identified defects or weaknesses need to be rectified;
    - establish that defects identified in the previous report of thorough examination have received attention;
    - assess the correct function of all safety devices;
    - check that warning notices are correctly fixed and legible; and where necessary specify any limitations on the use of the construction hoist;
    - witness any testing required as part of thorough examination;
    - report on the findings of the thorough examination.

14.3 *Qualifications and Experience*

Competent persons should have both appropriate recognised academic qualifications and a relevant level of practical experience in a related engineering field.

Employers must determine competence of each individual person, both existing employees and new entrants, based on the attributes listed above together with academic qualifications. A shortfall on attainment level does not preclude employment in this role but such shortfalls must be addressed before the person is allowed to carry out unsupervised thorough examinations of construction hoists.

The following are **examples** of those with the cumulative attributes necessary to support competence for the carrying out of thorough examination on construction hoists:

Example 1 - National/Scottish Vocational Qualifications (NVQ/SVQ) Level 3 Diploma in Plant Installations – Hoist option plus a Thorough Examination module (from a reputable organisation)

NOTE: *A Level 2 NVQ Plant Installations – Hoist plus a Thorough Examination module is also acceptable for goods only hoists with a Rated Capacity of 500 kg or less.*

NOTE: *Hoist-specific thorough examination modules are offered by a number of manufacturers.*

Example 2 - Level 4 (Engineer Surveyor) National/Scottish Vocational Qualifications (NVQ/SVQ)

Example 3 - Engineering Technician as defined by the Engineering Council or equivalent (e.g. appropriate HNC with relevant experience) having a minimum of 5 years experience within a relevant discipline, of which at least one year shall have been spent working within an engineering discipline related to lifting equipment;

Example 4 - Person trained in a relevant engineering discipline with a recognised and documented engineering apprenticeship (in lieu of an academic qualification) with a minimum of 5 years experience within a relevant discipline, of which at least one year shall have been spent working within an engineering discipline related to lifting equipment.

14.4 *Competent Person Selection*

Competent persons should be selected through a formally documented assessment process.

The purpose of the assessment, which must include a sufficiently robust technical interview and other elements, is to determine whether or not the interviewee has the general aptitude and appropriate level of relevant underpinning knowledge and understanding to perform the intended duties of a competent person when combined with the training provided by the employer.

14.5 *Medical Fitness*

All personnel should have an adequate degree of medical fitness to enable them to carry out their duties safely.

Detailed guidance on medical fitness is given in the Strategic Forum Safety Group's Good Practice Guide on Medical Fitness to Operate Construction Plant. (free download from www.cpa.uk.net).

14.6 *Training Plan*

An individual training plan should be drawn up for each person who is to carry out the thorough examination of construction hoists. Achievement of this plan and continuing professional development should be monitored at frequent intervals as part of the management review process (See **Section 17**) and included in the quality system (e.g. ISO 9000) auditing process.

14.7 *Training Courses*

Training courses covering both the management and practice of thorough examinations are available from various manufacturers, hirers and national training organisations.

14.8 *Technical Product Awareness*

Before carrying the thorough examination of a specific make and model of construction hoist, all personnel should receive technical information from the hoist manufacturer or the employer. This may be carried out in-house by a trainer who has received model specific technical training directly from the manufacturer.

14.9 *Assessment*

It is important that all competent persons are regularly assessed to ensure that they can carry out their duties safely and effectively. An in-house assessment should be undertaken of all competent persons on appointment and at regular intervals thereafter. Assessment should form part of any training.

14.10 *Continuing Professional Development*

Continuing Professional Development (CPD) is the conscious updating of professional knowledge and the improvement of a competent person's Competency throughout their working life. This is a joint responsibility between the competent person and their employer.

The competent person's employer should maintain a training, experience and development record for each competent person. The Record should include details of how CPD is being achieved and should include for example:

- Initial training towards achievement of competency;
- Specific training towards enhancements/additions to competency;
- Familiarisation/re-familiarisation, coaching and training;
- Any alterations and/or withdrawals of competency;
- Enhancements to qualifications;
- Membership of professional bodies/institutions;
- Attendance at seminars and any refresher training courses;
- Visits to manufacturers and trade shows.

14.11 *Training Records*

A comprehensive individual training record should be established for all personnel carrying out thorough examinations. This should be updated as training is undertaken and as a minimum should include:

- When the training took place;
- Where the training took place;
- The scope of the training including types and models of construction hoist;
- The duration of the training;
- The outcome of the training;
- Who delivered the training;
- When refresher training is required.

15.0 Information for Thorough Examination

15.1 *Introduction*

The wide variation of designs and the increasing complexity of construction hoist technology make it essential that all competent persons carrying out thorough examination are supplied with adequate information to enable them to carry out their duties effectively and safely. Information comes in various forms and from several sources.

15.2 *Construction Hoist Build Specifications*

A build specification for the individual construction hoist to be thoroughly examined must be made available to the person carrying out the initial thorough examination following erection. This should be in the form of a schematic drawing or table indicating the location of each major component or sub assembly. The information should be sufficiently detailed to enable the competent person to confirm that the specified components have been assembled correctly.

15.3 *Manufacturer's Information*

Information supplied by the construction hoist manufacturer or another competent source will be the main source of instructions and specifications when carrying out thorough examination. The primary document will be the maintenance manual for the specific hoist model (and in some cases serial number), supplemented by technical information bulletins.

Care should be taken to ensure that the information is up to date and relevant to the hoist on which the thorough examination is being carried out.

Manufacturer's manuals are not always complete and in the case where particular information is not covered, the hoist owner or manufacturer must be contacted for information **BEFORE** the thorough examination is undertaken.

15.4 *In-House Technical Information*

Some construction hoist owners will have their own technical information dealing with specific issues relating to the hoists in their fleet. This can be a useful source of information for thorough examination personnel, but care should be taken to ensure that circulation is controlled to ensure that information is current and that outdated data has been withdrawn.

15.5 *Method Statements and Work Instructions*

Most thorough examination work on construction hoists is of a routine nature and can be covered by generic risk assessments, method statements and work instructions. On occasions however, the hoist and/or site will present specific hazards and a job specific safe system of work will have to be put in place.

The system of work will be described in a job specific method statement on which all persons assisting the competent person must be fully briefed. This briefing should be recorded.

15.6 *Scope of Thorough Examination*

It is important that a scope of thorough examination is drawn up before a thorough examination is undertaken on a construction hoist. This should cover at least the following:-

- What is to be examined;
- Frequency of thorough examination;

- Details of any supplementary reports and tests;
- Anticipated duration.

The scope will be determined by hazard analysis, risk assessment and manufacturer's information. An example of a scope of thorough examination is given in **Annex 3.**

15.7 *Generic Information*

Competent persons may also need to refer to generic information such as standards and industry guidance. Examples of these are BS ISO 4309:2017, *Cranes. Wire ropes. Care, maintenance, installation, examination and discard,* and the CPA Construction Hoist Interest Group's *Technical Information Note* series. (https://www.cpa.uk.net/construction-hoist-interest-group/)

Care should be taken to ensure that the information is up to date.

15.8 *Machine History*

The history of the repairs and maintenance carried out on a construction hoist is essential to a competent person carrying out a thorough examination. Details of any structural repairs, welding and any non-routine maintenance carried out subsequent to the previous thorough examination, together with any reoccurring issues, should be presented to the competent person at the time of the next thorough examination.

15.9 *Supplementary Reports and Tests*

The purpose of the supplementary tests is to support the thorough examination in order to establish the equipment's suitability for continued safe use. These supplementary tests may be specified by the competent person and can cover a wide range of techniques, not just overload testing. They will need to be undertaken, completed by the date specified and documented in order to enable the subsequent thorough examination to be completed. Failure to complete the supplementary tests may preclude the completion of the subsequent thorough examination. In some circumstances, the competent person may wish to witness the 'supplementary tests'. In particular, they should witness the following:

- Functional test and confirmation of calibration of load limiting device;
- Safety Device drop test.

The results of any tests not witnessed by the competent person should be forwarded to the competent person, for review and assessment, without delay.

Other supplementary tests and corresponding reports on construction hoists may include, where applicable:

- Load test following erection;
- Non-destructive examination of individual components;
- Pre-loads on high tensile bolts;
- Pre-delivery inspections;
- Foundation design specification;
- Foundation 'as built' report;
- Tie installation report;
- Temporary works approval;
- Hoist configuration drawing/report;
- Earth continuity test;

- Report of inspection and test of electrical control equipment;
- Report of inspection and test of lightning protection.

In practice, the construction hoist owner and the competent person may wish to agree and periodically review the specific supplementary test reports that will be provided prior to each thorough examination following erection and each subsequent in-service thorough examination. These should at a minimum include functional test and confirmation of calibration of any load sensing system, hoist motor brake and safety device test, load test following erection and hoist configuration drawing/reports. Additional supplementary tests will be requested by the competent person as circumstances demand.

15.10 *Previous Reports of Thorough Examination and Supplementary Tests*

Where a construction hoist has been previously examined, the reports of the most recent thorough examination and any supplementary tests carried out should be made available to the competent person before they carry out the current thorough examination. Good practice guidance is that all reports of thorough examination are kept for the life of the construction hoist.

15.11 *Information on Clearance of Defects*

Where a previous thorough examination report has identified defects requiring rectification, evidence of clearance of those defects should be made available to the competent person before they carry out the current thorough examination.

15.12 *Information Formats*

Paper information, such as that found in manuals and bulletins, is rapidly being replaced by electronic formats and website downloads. This has the advantage that physical storage space is kept to a minimum and information should be up to date at the point of access. However the use of electronic devices during thorough examination is not always easy or practical. Information may therefore have to be printed out for use on site, in which case care should be taken that for any subsequent use the data is current and relevant.

Facilities should be available on site to print any document required by the competent person. Any printout should be marked ‘uncontrolled’.

15.13 *Management of Information*

Information should be managed effectively if it is to be of maximum benefit to those involved in the thorough examination process. Outdated information can at best waste time and at worst may well affect safety. It is therefore essential that organisations carrying out thorough examination of construction hoists ensure that they have robust systems and procedures to ensure that personnel are supplied with adequate information that is both up to date and accurate.

16.0 Reports of Thorough Examination

16.1 *Introduction*

LOLER requires that the competent person carrying out a thorough examination of a construction hoist makes a report of that thorough examination in writing to the user of the hoist and to the person from whom the hoist has been hired. The report must be authenticated by the competent person, or on their behalf and must contain the information specified in Schedule 1 to LOLER.

16.2 *Categorisation of Defects*

Where defects are found during the thorough examination of a construction hoist, the competent person will make a judgement on the severity of the defect and its potential to affect the safety of persons. To assist this process, defects are divided into three categories:

- Defects affecting the safety of persons that are to be remedied immediately;
- Defects affecting the safety of persons that are to be remedied within a specified period of time;
- Observations/recommendations which may require planning for resolution and may be outside the strict scope of the thorough examination.

16.3 *Required Level of Detail*

Defects should be reported in a sufficient level of detail to enable the hoist owner to identify the exact location and nature of the defects, and decide on a course of appropriate action to rectify those defects. Reports should be clear and readily understood by hoist users. The use of abbreviations should be avoided.

16.4 *Distribution of Reports*

Generally construction hoist thorough examinations are carried out on behalf of, or by, the construction hoist owner. The thorough examination report is therefore sent to the hoist owner who should then immediately send a copy to the construction hoist user, as the user has a duty to ensure that the hoist is safe to use.

16.5 *Report Completion Timescale*

Where defects are found during a thorough examination which are or could become a danger to persons, then the competent person must inform both the user and the owner so that the hoist can either be prevented from being put into service, or is taken out of service until the defects have been satisfactorily rectified. This is often accomplished by leaving an interim, hand-written report on site and making contact with the hoist owner. In the case of an in-house competent person, they will often have the authority to take the hoist out of service immediately.

NOTE: *Examples of a suitable interim report include the site register, work sheet or the check list in* ***Annex 5.***

Where the competent person identifies defects which need to be made good within a specified time scale and could become a danger to persons, they should submit the report promptly to allow the construction hoist owner to take the necessary action within the required period. In normal circumstances, the competent person should complete the report of thorough examination and forward it within a maximum of 28 days.

16.6 *Inclusion of Cleared Defects*

On occasions, the competent person carrying out the thorough examination will be accompanied by the construction hoist owner's maintenance personnel and as defects are discovered, they may be immediately rectified. In this case, all defects **MUST** be recorded on the report of thorough examination even if they have been cleared. Failure to report defects is contrary to the requirements of LOLER, will give a false picture of the condition of the hoist, plus invalidate both the machine history and the review process.

16.7 *Notification to the Enforcing Authority*

Where, in the opinion of the competent person, the thorough examination identifies a serious defect in the construction hoist which involves an existing or imminent risk of serious personal injury arising from failure of the hoist - which may occur at the next use or a short time thereafter - the competent person must send a copy of the report to the local office of the relevant enforcing authority. In most cases this will be the local office of the Health and Safety Executive.

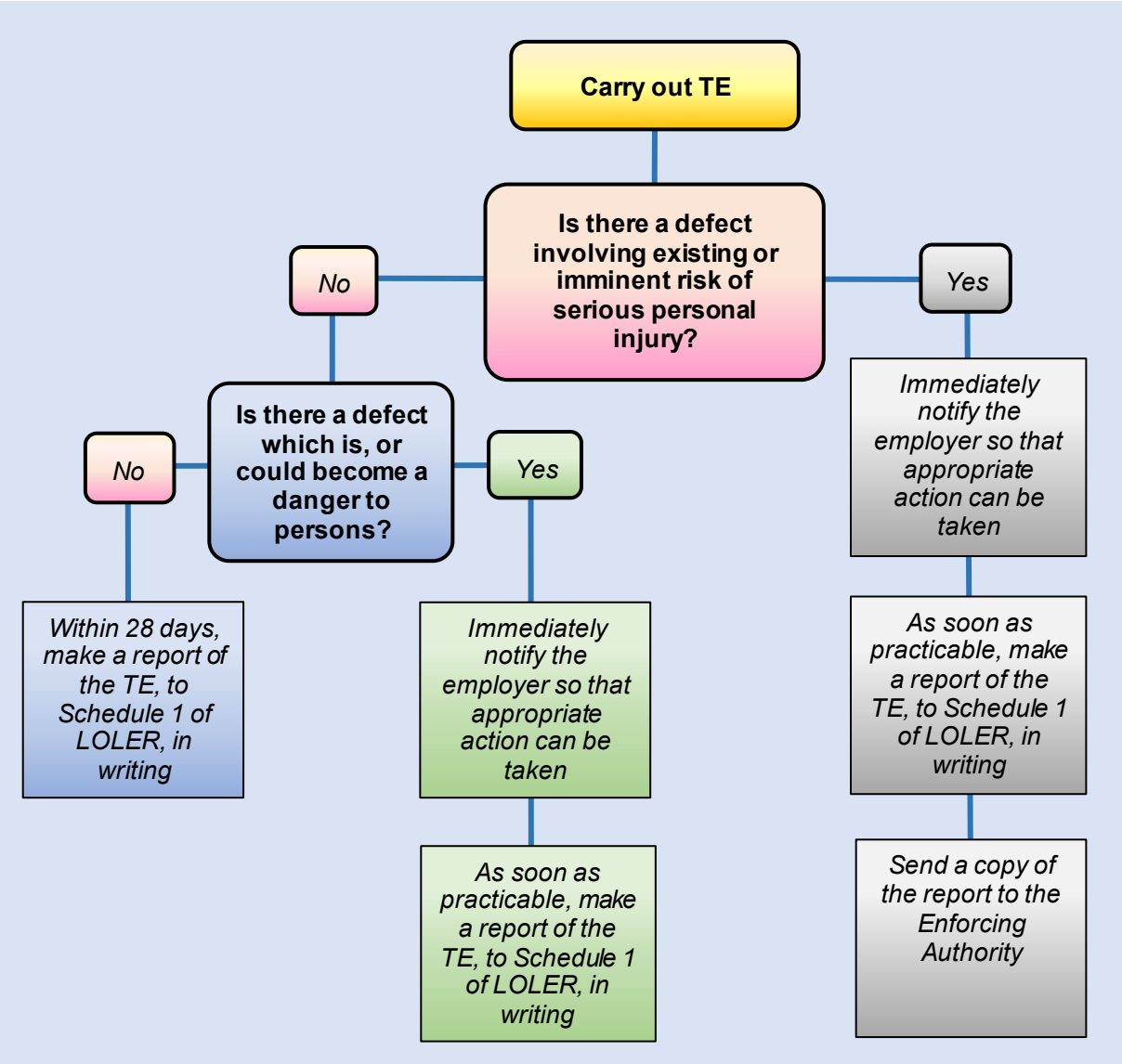

Figure 4 - Through Examination Reporting Process

17.0 Management Review of Thorough Examination Records

17.1 *Introduction*

A regular management review of construction hoist thorough examination records is essential for the safe and efficient operation of a construction hoist fleet. It ensures that management can be confident that robust maintenance and thorough examination systems are in place, which will rapidly highlight any shortcomings and the need for corrective action. It may be beneficial to include competent persons or the employer of third party competent persons in this process.

17.2 *Benefits*

The benefits of regular management review of thorough examination records include:

- Confidence that the system is functioning correctly;
- Identification of extraordinary defects, events and failures;
- Ensuring that there is evidence of adequate maintenance and thorough examination to the Enforcing Authorities in the event of an incident and a subsequent investigation;
- Establishing trends over time and informing the review of the examination frequency;
- Feedback to the maintenance activity;
- Identification of component failure trends for feedback to the manufacturer;
- Highlighting on-site thorough examination access problems for feedback to the manufacturer to improve future designs;
- Monitoring the performance of individual hoists over time to inform future purchases;
- Ensuring that defects are rectified in a timely manner.

17.3 *Review Frequency*

The review should be carried out initially at least monthly. Once a suitable level of confidence in the systems has been established, the review frequency may be reduced in the light of experience.

17.4 *Review Methodology*

The review should aim to identify exceptional events such as occurrences of heavy expenditure and reoccurring faults. It should also measure achievement of maintenance activities against target.

17.5 *Review Records*

It is essential that written records of the management review are made, both as evidence that the reviews have been undertaken and to evaluate long term trends.

Annex 1 – Definitions

appointed person (supplier)

the person appointed by the hoist supplier who is responsible for planning the installation, method statements for the erection, safe operation, inspection, maintenance, thorough examination and dismantling of the hoist

appointed person (user)

the person appointed by the management/user organisation who is responsible for devising safe systems of work and other aspects of use of the hoist

competent engineer

person who has such theoretical knowledge of the design of the lifting equipment as enables them to assess the design of the item in order to establish appropriate criteria for a thorough examination

competent person

person who has such practical and theoretical knowledge and experience of the lifting equipment to be thoroughly examined which enables them to detect defects or weaknesses and to assess their importance in relation to the safety and continued use of the lifting equipment

hoist installation

for the purposes of this document, hoist installation means all parts of the hoist including the drive mechanisms, safety mechanisms, mast and tie arrangements, access to the landings, and hoistway protection at the landings including landing gates, landing interface and base enclosure

hoist types:

goods-only hoist

a vertical hoist where persons are not allowed to travel on the platform but which permits, if necessary, the access and travel by persons who are competent and authorised during:

- erection;
- dismantling;
- maintenance;
- inspection.

Such a hoist may allow access to the platform for the purposes of loading and unloading when stationary at a landing level.

inclined hoist

a goods-only hoist where the platform is designed to travel at any angle between the vertical and the maximum inclination as specified by the manufacturer.

passenger/goods hoist

a vertical hoist where persons are allowed to travel within a fully enclosed cage.

transport platform

transport platforms are different from passenger/goods hoists in that:

- they are designed for the transportation of materials and/or persons, controlled only by an appointed operator travelling on the platform;
- the platform has a roof but is not fully enclosed;
- the platform is positioned at least 0.5 metres from the supporting structure;
- the number of persons travelling on the platform, including the appointed operator, is restricted.
- the total weight of persons is typically 50% of the rated load of the platform;
- motion is initiated by 'hold to run' controls;
- speed is limited to 0.2 metres per second (12 metres per minute)

in-service

condition where the hoist is carrying loads up to and including the rated capacities within permissible wind speeds and other conditions as specified by the manufacturer during normal operation following thorough examination

instantaneous safety mechanism

a mechanism usually fitted to wire rope hoists, which arrests and supports the cage or platform together with its rated load in the event of a failure of the suspension rope(s). This mechanism generally operates instantaneously

landing interface

all items associated with a hoist installation which are not always supplied with the hoist. Such items include the threshold between the hoist platform and the landing, side protection at landings and hoistway protection

monitor

person who has the necessary competence to make objective and valid judgements about the competence and independence of a competent person carrying out the thorough examination of work with which they have been directly involved

out-of-service

condition where the hoist is either not required for use or is out of use, without a load on the platform and in conditions as specified by the manufacturer

***NOTE**: These conditions may include a higher wind speed than that permitted for the in-service conditions.*

overspeed safety device

a mechanical device, usually fitted to a rack and pinion hoist, that is independent of the means of suspension or drive, which arrests and supports the cage or platform together with its rated load in the event of overspeed in a downward direction. It comprises an overspeed governor, which is set by the manufacturer and operates at some predetermined speed in excess of the maximum rated speed and a safety gear which, when 'actuated' by the governor, clamps the hoist platform or cage to the mast or guides

maintenance

the process of ensuring that a construction hoist is kept in a safe state, in efficient working order and in good repair

testing:

functional testing

operation of each motion of the appliance without a load applied in order to determine whether the equipment performs as the manufacturer intended

non-destructive testing (NDT)

testing carried out on the structure of the appliance 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).*

overload testing (static)

operation of the appliance with a load exceeding the rated load applied but without operating the full range of motions of the appliance in order to determine whether the appliance is stable, structurally sound and fit for the use for which it was designed

overload testing (dynamic)

operation of each motion of the appliance with a load that exceeds the rated load applied in order to determine whether the appliance is stable, structurally sound and fit for the use for which it was designed

performance testing

operation of each motion of the appliance with the rated load applied in order to determine whether the equipment performs to the manufacturer's specification

supplementary tests

appropriate tests and/or examinations called for by the competent person where concerns regarding the condition of equipment arise from the thorough examination or where additional or more arduous use may be taking place

thorough examination

examination by a competent person in such depth and detail as the competent person considers necessary to enable them to determine whether the equipment being examined is safe to be taken into or continue in use

NOTE: *The thorough examination is not part of the maintenance regime for the equipment, but provides owners with information which could be used to determine the effectiveness of the regime.*

Annex 2 - Example of a Typical Safe System of Work for Thorough Examination Activities

A 2.1.0 Introduction

This safe system of work considers the hazards and risks when undertaking the examination of construction hoists. As a necessity of examination, the hoist will have to be operated to prove satisfactory function and operation. This creates added risks such as falling from the hoist, being trapped, crushed or struck by hoist movement. The safe system is to raise awareness of the hazards and therefore reduce the risks involved so far as is reasonably practicable.

A 2.2.0 Scope

The guidance covers work associated with the examination of all types of construction hoist.

A 2.3.0 Legislation and other publications

A 2.3.1 *Legislation*

The following is a summary of relevant legislation, including:

a. Health and Safety at Work Act 1974;
b. The Supply of Machinery (Safety) Regulations 2008;
c. Provision and Use of Work Equipment Regulations 1998 (PUWER);
d. Lifting Operations and Lifting Equipment Regulations 1998 (LOLER);
e. Management of Health and Safety at Work Regulations 1999;
f. Work at Height Regulations 2005 (as amended 2007).

Note: *This list is not exhaustive and reference may need to be made to other Legislation as applicable.*

A 2.3.2 *Other relevant guidance includes:*

a. Safe use of construction hoists: BS 7212;
b. Safe use of ladders, step ladders & trestles, INDG 455;
c. In-house procedures and instructions;
d. Personal Protective Equipment.

Note: *This list is not exhaustive and reference may need to be made to other Legislation as applicable*.

A 2.4.0 Hazards

A 2.4.1 *Anticipating the Consequences of Actions*

Many accidents occur because of a lack of planning and/or consideration of what could happen as a result of actions on site.

A 2.4.2 *Known Hazards*

Examples of how injury can occur when undertaking the examination of construction hoists include:

a. Trapping / Crushing;
b. Falling;
c. Being struck;
d. Electrical shock.

A 2.4.3 *Hazard details*

A2.4.3.1 Trapping and crushing points

There are many trapping points to consider when undertaking the examination of construction hoists. Trapping hazards are present at following areas:

a. At rope drums and diverter sheaves (hands or clothing being caught between ropes and rope drums and diverter sheaves). Moving counter balance systems;

b. Hoisting/lowering of ropes: At rope drums and rope diverter sheaves, and pulley systems. Rotating machinery, i.e. brake drums, shafts, couplings, winches etc;

c. Between hoist cages, masts and ties;

d. Between hoist cages and landings.

A2.4.3.2 Falling

Generally falls can occur at any time when undertaking the examination of construction hoists. By virtue of their construction, climbing and access to areas above ground are a necessity. The risk from falling is present when:

a. Climbing masts, machine structures; slipping from ladders and hoist structure;

b. Using ladders and other means of access;

c. Slipping on oil/grease on hoist structure and ground, unstable or uneven ground conditions;

d. Tripping over obstacles on hoist being examined, and items at ground level on site;

e. Deteriorating weather conditions, e.g. ice, rain and wind present.

A2.4.3.3 Being struck

a. By moving parts of the hoist undergoing examination e.g. hoist cage or counterweights;

b. By load hooks and suspended loads on cranes;

c. By other plant and mobile systems in operation at site;

d. By chain slings and lifting beams, and frames suspended from cranes;

e. By failure of the hoist under examination e.g. loads being dropped, failure of hoist structures;

f. From projections on machinery and buildings.

A2.4.3.4 Other hazards

a. Risk of electrical shock from live equipment and poorly maintained systems;

b. Fumes and dust from site work. Dust from overhead areas due to disturbance during examination;

c. Catch points - clothing or rings being caught on protrusions;

d. Noise - from hoist being examined and adjacent work processes;

e. Vibration - from hoist being examined.

A 2.5.0 Safe Working on Construction Hoists - General

Prior to examination of construction hoists:

A 2.5.1 *Access & Egress*

The competent person shall make his presence known to a responsible person at the location. At the end of his visit the competent person shall advise that person that he is leaving the site.

A 2.5.2 *Unoccupied Premises*

Under no circumstance shall the competent person work alone at unoccupied premises or carry out any examination at premises where no member of the client's staff (or other responsible person) is present.

A 2.5.3 *Appropriate Clothing*

Competent persons shall wear suitable protective clothing and equipment, e.g. safety helmet, boiler suit, gloves, suitable safety boots or shoes, and safety harness. All shall be maintained in good condition and properly worn.

A 2.5.4 *Personal Protection & Safety Equipment*

Other personal protection and safety equipment shall be worn according to the site conditions and clients site safe systems of work, e.g. eye protection hearing protection, high visibility clothing, personal buoyancy equipment, and respiratory protective equipment.

A 2.5.5 *Thorough Examination Plan*

Competent persons shall plan the sequence of their examination prior to commencement. This is essential when undertaking the examination of hoist systems with regard to health and safety.

Planning should include the following:

a. A suitable and satisfactory emergency release/rescue procedure must be in place and capable of being initiated, if required, prior to commencement of examination;

b. Briefing of the responsible person on site and hoist operator as to the sequence of examination;

c. The hoist operator must fully understand the examination procedure and the system of hand signals to be used, where applicable. All personnel must understand the emergency signals and procedures;

d. Examinations of hoists should, where possible, be away from regular site traffic and site routes. This will reduce the risk from being struck by, and striking, other site traffic and site personnel;

e. Ensure adequate clearance and sufficient operating space between the hoist being examined and adjacent fixtures to prevent trapping and crushing hazard.

A 2.5.6 *Isolation*

Where hoists need to be isolated for inspection purposes, the competent person shall ensure power is isolated from the hoist. This should consist of switching off power where required, locking off isolators with padlocks, and displaying warning notices at the isolation points.

A 2.5.7 *Operation of Construction Hoists*

Operation of construction hoists shall be carried out by the normal hoist operator or another competent operator who has been familiarised with the hoist in question, except where it is necessary for the competent person to do so as part of his examination.

A2.5.7.1 Unrestricted View

The hoist operator must have a clear view of operations.

A2.5.7.2 Surveyor Restrictions

Competent persons should not operate motions of the hoist for any other purpose than the minimum amount strictly necessary to carry out the examination.

Where it is necessary for the competent person to operate the hoist themselves, they shall:

a. obtains prior permission of a responsible person at the location;

b. takes all reasonable care during the operation of the hoist;

c. satisfies themselves that all reasonable safety precautions have been taken;

d. ensure that the hoist is left in a safe condition at the end of the examination.

A2.5.7.3 Client Responsibility

Under no circumstance shall a competent person operate any hoist if they have the slightest doubt as to their own ability to do so or the authority of the person giving them permission to do so. In all such cases, the competent person shall request the client provides a competent operator.

A 2.5.8 *Environmental Conditions*

Careful attention should be given to hoists operating in situations where they are likely to be affected by the weather. Certain weather conditions such as strong wind, heavy rains, ice or snow can impose loads on a hoist and adversely affect the safety of hoist operations. Never undertake examinations when the hoist or load cannot be easily seen due to limitations on visibility or when coated with ice or snow. Hoists should not be operated in wind speeds in excess of those specified in the operating instructions for the hoist.

A 2.6.0 During examinations

A 2.6.1 *Safe Access*

A safe means of access should be used to reach parts of the hoist requiring inspection above ground level. i.e. properly secured ladders, access platforms and/or safety lines. When working above ground level, a safety harness should be worn by the competent person when there is an identifiable risk of falling.

A 2.6.2 *Climbing Precautions*

A good footing and handholding should be kept when climbing hoist structures whilst watching for obstacles, protrusions, oil and grease deposits, ice and water which may cause a tripping or slipping hazard.

A 2.6.3 *Other Hazards*

Competent persons should not position themselves close to open excavations, pits or waters edge during course of examination without taking appropriate safety precautions.

A 2.6.4 *Moving the Hoist and its Parts*

When the hoist is being moved during an examination, the competent person should position themselves clear of all moving parts and have a clear view of the operator. Where this is not possible, either a banksman should be used to relay the competent person's signals to the operator or electronic communication systems should be used.

A 2.6.5 *Other Plant*

An awareness should be maintained for other plant moving on site and adjacent to the plant being examined.

A 2.6.6 *Rope Inspections*

Gloves should be worn when inspecting hoist ropes etc. If it is necessary to examine ropes when they are moving, ensure they are moving at slow speed and away from in-running nips, and hoist and winch drums. Running ropes should not be passed through the hands. It is vital that the competent person has instant communication with the hoist operator.

A 2.6.7 *Suspended Loads*

No one should be standing beneath suspended loads or parts of the hoist which could descend.

A 2.6.8 *Buoyancy Aids*

Buoyancy aids/life jackets must be worn when undertaking examinations adjacent to waters edge.

A 2.6.9 *Trapping*

A competent person should always position themselves where they will not be trapped between adjacent fixed structures and the hoist being examined.

A 2.6.10 *Crushing*

Hands, arms, feet and head should be kept clear of any potential trapping or crushing points. i.e. plant pivot and articulating points, sliding and telescoping components, open rotating parts.

A 2.6.11 *Pendant Controls*

When working at height on a hoist, pendant controls should not be within reach of anyone who could inadvertently operate the hoist during examination.

A 2.7.0 Permit to work

Some clients operate a 'Permit to Work' system when work is required on certain plant. The permit to work system is an extension to the safe system of work when written authorisation is required before a particular job can be started.

A 2.8.0 Summary

The preceding sections outline the main considerations to achieve a safe system of work when undertaking examinations of lifting plant. Physical layout and operational facilities vary considerably depending on client's premises and the construction hoist crane being examined; therefore the safe system of work must be adapted to take into account the particular characteristics and situation of the hoist being examined and the working environment in which it is operating.

Annex 3 – Example of a Scope of Thorough Examination for Construction Hoists

A3.1.0 *Scope and nature of the thorough examination*

This section lists the components and elements of a hoist that need to be thoroughly examined and the following gives details on how the examination should be carried out.

A3.2.0 *Structural examination*

Examine the load bearing items such as masts, mast bolts, ties, fixing anchors, the load carrying device (cage/platform) and the base support. Ensure that no cracking or permanent deformation has occurred and that no connections have loosened or become damaged during test or in previous operation in either the hoist itself or its connections to any adjacent structures.

A visual examination should be supplemented by non-destructive testing whenever the competent person considers this to be necessary.

A3.3.0 *Mechanical drives*

Examine the racks and pinions, drive drums, pulleys, gearboxes, transmissions, motors, brakes, guide rollers, counter rollers, drive shafts and the emergency lowering system, to detect undue wear or malfunction.

A3.4.0 *Safety components*

Examine the overspeed safety device, load control device, manual lowering device, alarm systems, intercoms, ultimate end-of-travel limits or stops, retaining hooks, buffers, handrails, escape ladders, guards etc.

A3.5.0 *Wire ropes and associated components*

Examine the condition of wire ropes, pulleys/sheaves, wire rope terminations, slack rope device, drum spooling device, counterweights and their guides, etc. A detailed examination should be made of wire ropes, if fitted, with special regard to:

- broken wires;
- surface wear;
- excessive stretching;
- unequal rope tensions,
- variations in diameter;
- kinks;
- localized crushing;
- ‘bird caging’ due to mis-spooling and surface rust and corrosion.

It is not possible to stipulate the life of suspension ropes because of the many variables, but special care should be exercised during examination if a wire rope is more than two years old. A useful reference for wire rope discard criteria is the international standard *ISO 4309:2017 ‘Cranes - Wire ropes - Code of practice for examination and discard’.*

A3.6.0 *Cage and platform gates, ramps and flaps*

Examine for the correct function and mechanical integrity of the gates, ramps and flaps, side protection etc. paying special attention to hinges, electrical and mechanical interlocks, actuating devices, latches, restraining mechanisms, guides and rollers etc.

A3.7.0 *Landing gates and base enclosure gates and their interlocks*

Examine for the correct function and mechanical integrity of the gates, paying special attention to the security of fixings, condition of the in-fill mesh, hinges, electrical and mechanical interlocks, latches, restraining devices, guides and rollers etc.

A3.8.0 *Hoistway protection*

Hoistway protection is designed to reduce the risks from persons or objects coming into contact with the moving platform or falling into the hoistway. The hoist user shall ensure that hoistway protection is provided over the full height of travel of the platform and that the threshold between the platform and the landing level is in-filled to prevent persons or materials from falling through.

Examine the base enclosure, landing gates, in-fills and any fixed guards at landings provided by the hoist installer for mechanical integrity and security of fixings. Some parts of the protection are often provided by a third party, for example, a scaffolding contractor. The competent person should record any obvious defects or omissions of this protection on the report of thorough examination. If the hoistway protection is not complete, the hoist cannot safely be put into service for its intended use.

Further guidance on the management arrangements for the examination of the hoistway protection is contained in **13.7**. See CPA *Best Practice Guide on Safeguarding Requirements for Landing Gates of Goods-only Construction Hoists CHIG 0401.*

A3.9.0 *Signs*

Ensure that signs for rated load and maximum number of persons, operating instructions, safety information and warnings are in place and legible. Also ensure that the legends on the operating controls are legible.

A3.10.0 *Functional test*

Undertake the following tests to confirm correct operation:

- residual current device (RCD) and the machine isolator switch;
- electrical control/safety circuits of the cage/platform - check the operation of emergency stop controls, alarms, operating controls and erection controls;
- any other controls such as landing call stations;
- all hoist trailing cable restraint and storage systems;
- terminal stopping switches and their activating devices;
- ultimate stopping switches/devices and their activating devices;
- landing and cage gates - mechanical, electrical and activating devices;
- the brakes for satisfactory operation.

Note: *Where possible, the test should be undertaken with the cage/platform near ground level.*

A3.11.0 *Load control device test*

On hoists fitted with load control devices, test these according to the manufacturer's instructions.

A3.12.0 *Load test*

Undertake a load test, which is a test to confirm the structural integrity of the mast sections, ties and their fixings, and cage/platform. It also confirms the effectiveness of the

braking systems. Before carrying out the load test, carry out a visual inspection and functional tests.

After the erection of the hoist, alteration on site and exceptional circumstances, the load test is initially carried out at 100% of the rated load and then at overload as per manufacturer's instructions.

At in-service periodic thorough examinations, the test load is a minimum of 100% of the rated load.

During the test, the hoist should be tested over the full range of normal operated travel.

Following the load test, the hoist installation should be inspected for signs of damage or deterioration caused by the test.

A3.13.0 Drop test

Where required, undertake a drop test. Hoists make use of an overspeed safety device that may require drop testing. The method of drop testing and the acceptance criteria should be in accordance with the manufacturer's safety instructions. It is advisable to devise a written method statement based on risk assessment.

Any suspected fault in an overspeed safety device should be referred to the manufacturer for proper checks to be carried out. Under no circumstances should the governor tripping speed be altered. If necessary, other parts of the hoist might have to be dismantled by a skilled person to the degree required by the competent person for his inspection.

Under the Construction (Lifting Operations) Regulations 1961, now revoked, it was a legal requirement to drop test rack and pinion hoists every three months, often with a thorough examination of the complete installation. With the introduction of LOLER 1998, when the competent person makes his decision on continuing with this practice, it is recommended that the following is taken account of:

- the manufacturer’s recommendations;
- the hoist’s duties;
- the working environment.

Options that may be considered would include three-monthly drop testing of all hoists with no load and six monthly drop testing of goods hoists with rated load.

A3.14.0 *Electrical installation*

A3.14.1 Pre-delivery examination

Inspect and test the integrity of the hoist electrical system. It is often more convenient to carry out these inspections and tests at the supplier’s workshops, immediately prior to delivery, rather than on site. These inspections and tests should be carried out as a part of preventative maintenance and as a part of the thorough examination where evidence is not available to show that this has been done.

Inspections and tests should be performed to determine the functional integrity of those parts of the control circuit that cannot be examined visually, namely:

- continuity test of the protective bonding circuit;
- insulation resistance test (at a minimum of 2 x rated operating voltage) to assess the integrity of electrical insulation;
- functional test of each safety related control system from sensor through to final actuator, to determine that the whole system is working satisfactorily;

- check that the fuses and miniature circuit breakers installed are rated in accordance with the manufacturer's data;
- visual examination of the condition of solenoids and contactors etc., if the competent person has concerns about the integrity of the electrical control circuit.

A3.14.2 Examination following installation

For hoists which are not connected to the site supply by a plug and socket arrangements, contractual arrangements should be put in place to ensure that once the hoist has been installed and connected to the site supply, the insulation resistance and the continuity of the protective bonding circuit are tested.

Guidance on electrical safety in construction is available for download from https://www.hse.gov.uk/electricity/information/construction.htm

For all hoists, the thorough examination should include the visual and functional checks described in **A3.10.0**.

To ensure that critical elements are free from contamination by dust, moisture or damage that may inhibit safe operation of the hoist, examination of the external condition of the following parts should be performed, supplemented by appropriate tests:

- machine control panels - an external visual examination to determine whether dust, moisture etc. can enter the panel causing defects such as short-circuit of devices, prevent operation of control gear etc;
- cabling, wiring, conduits, junction boxes, glands, etc. - an external visual examination to determine the integrity of insulation, seals etc;
- motor and drive assemblies - an examination for undue noise, vibration or excess heat;
- lamps, indicators and displays - a visual inspection to ensure that lamps etc are working correctly and that they actually provide their designated information.

Following installation, the condition of the cabling to newly installed parts of the electrical circuit such as the gate interlocks, landing call stations and top travel limits should be visually inspected.

Upon completion of the thorough examination of the electrical system, the competent person should ensure that all covers and panels are properly fitted and any shorting links used during tests have been removed.

A3.14.3 Periodic examination

Carry out the inspections and tests described in **A3.10.0**

A3.15.0 Non-destructive testing

During thorough examination of a hoist's structure and mechanism, it may be appropriate to use certain non-destructive testing (NDT) techniques to assess the integrity of components. These techniques can assist in the detection of cracks or wear that might grow in service and ultimately lead to failure.

NDT should only be carried out by people who are competent in appropriate NDT techniques who should be briefed on the purpose and extent of the NDT examination required, for example, the typical locations and type of defect anticipated.

Guidance on the qualifications and certification of persons undertaking NDT is given in *'BS EN ISO 9712:2012: Non-destructive testing. Qualification and certification of NDT personnel'.*

The three most common types of NDT used for in-service inspections of hoists are:

- ultrasonic examination;
- dye penetrant;
- magnetic particle examination.

For further information on these types of NDT, HSE has published:

'Best practice for the procurement and conduct of non-destructive testing'

- *Part 1 – Manual ultrasonic inspection;*
- *Part 2 – Magnetic particle and dye penetrant inspection.*

Guidance on NDT can be downloaded from:

https://www.hse.gov.uk/comah/sragtech/ndt1.pdf

https://www.hse.gov.uk/comah/sragtech/ndt2.pdf

Annex 4 – Sample Document Covering Maintenance and Thorough Examination Issues for Construction hoist Users

The effective maintenance and thorough examination of construction hoists erected on construction site depends of a significant degree of cooperation between the construction hoist supplier/owner and the Principal Contractor. Construction hoist users (Principal Contractors) are frequently unaware of the part they have to play and the intention of this document is to provide construction hoist suppliers/owners with a means of making users aware of their responsibilities and the need for effective cooperation.

A4.1.0 *Introduction*

An important part of the safe use of construction hoists on construction sites is ensuring that construction hoists are effectively maintained and subject to thorough examination at the appropriate intervals. This is normally undertaken by the construction hoist owner and it is essential that construction hoist users fully appreciate the need to allocate sufficient time in the construction programme to allow these tasks to be carried out effectively.

This document identifies the maintenance and thorough examination issues that must be agreed between the construction hoist owner and user before a construction hoist is erected on site.

A4.2.0 *Responsibility for Maintenance and Thorough Examination*

Both the *Provision and Use of Work Equipment Regulations 1998* (PUWER) and the *Lifting Operations and Lifting Equipment Regulations 1998* (LOLER) are very clear that the responsibility for ensuring that the maintenance and thorough examination of construction hoists is carried out, lies with the user of the construction hoist. In the case of a hired-in construction hoist, the actual undertaking of maintenance or thorough examination is often delegated to the hoist owner by the user. The user, however, retains the legal responsibility for ensuring that both maintenance - including the rectification of defects, and thorough examinations are carried out.

A4.3.0 *Downtime During Maintenance and Thorough Examination*

The main purpose for a construction hoist being on site is to carry out lifting operations as part of the construction process. Site managers may be reluctant to stop the hoist whilst maintenance or thorough examination is carried out. If maintenance or thorough examination downtime is not scheduled into the construction programme, it may be 'pushed to the back of the queue' and could end up being carried out hurriedly in unsafe conditions, such as poor light.

It is therefore essential that construction hoist users understand that both maintenance and thorough examination are a legal requirement and that adequate downtime must be built into the site programme. Construction hoist owners should inform those hiring their hoists of the frequency and expected time required for maintenance and thorough examination at the planning stage, well before the hoist arrives on site.

Construction projects in built up areas often have environmental restrictions imposed on them which severely limit working time at weekends and such restrictions must be taken into account when planning maintenance and thorough examinations.

A4.4.0 *Lines of Communication*

It is essential that effective lines of communication are established between the user and those planning and carrying out both maintenance and thorough examination of construction hoists. This will avoid much frustration and misunderstanding on both sides.

A4.5.0 *Availability of Persons to Assist*

Maintenance and thorough examination may require the assistance of a person familiar with the safe operation of the hoist. Arrangements must be made to ensure that a person such as the operator is available on such occasions.

A4.6.0 *Availability of Power*

Maintenance and thorough examination requires the hoist to be operational and arrangements must be made to ensure that power is available.

A4.7.0 *Availability of Site Facilities*

When maintenance or thorough examination is being carried out outside normal working hours, arrangements must be made to ensure that site management, safety and welfare facilities are available to maintenance personnel, the competent person and any personnel assisting them.

A4.8.0 *Access For Deliveries*

Maintenance operations, particularly the rectification of breakdowns often require spare parts to be delivered to site. Care must be taken to ensure that there is adequate access for delivery and that adequate acceptance procedures are in place to ensure that the parts are available when required by maintenance personnel and are not lost on site.

A4.9.0 *Load Testing*

Any load testing of construction hoists will require careful planning. The consequence of a collapse during testing must be evaluated and a suitable exclusion zone put in place. Planning should also ensure that test weights can be safely transported to the hoist, taking particular note of manual handling issues.

A4.10.0 *Lone Working*

Lone working should be avoided at all times by suitable liaison with the person in control of the site to ensure that site personnel are always in attendance at the hoist (See **A4.5.0**).

The planning process for work at height on construction hoists should take into account the particular hazards of lone working and thorough examination at height by lone workers should not be undertaken.

A4.11.0 *Work at Height*

Some maintenance and thorough examination activities on erected construction hoists may require maintenance personnel or competent persons to work at height outside edge protected areas on the construction hoist structure. The Work at Height Regulations 2005 set out a hierarchy of fall protection measures to be taken when planning work at height. (See Fig **A.3.1.)**

This means that those planning work at height on construction hoists should:

- Avoid work at height wherever possible and actively seek solutions to facilitate this;
- If this is not possible - use “collective” means of protection such as guardrails;
- If this is not possible - use “personal” means of prevention such as work restraint;
- If this is not possible - use a personal fall protection system such as a work positioning system or fall arrest system;
- Additionally, provide training and instruction or take other measures to prevent any person falling a distance liable to cause personal injury.

Where a risk assessment indicates that a personal fall protection system is required, a work positioning system should always be used in preference to a fall arrest system. Where the use of fall arrest personal fall protection systems are unavoidable, there will be a risk of the wearer being left suspended following a fall and arrangements must be made to ensure that they can be rescued in a safe and timely manner.

Specific guidance on work at height on construction hoists is given in the CPA Best Practice Guide - *Work at Height on Construction Hoists* which can be downloaded free of charge from the CPA website www.cpa.uk.net.

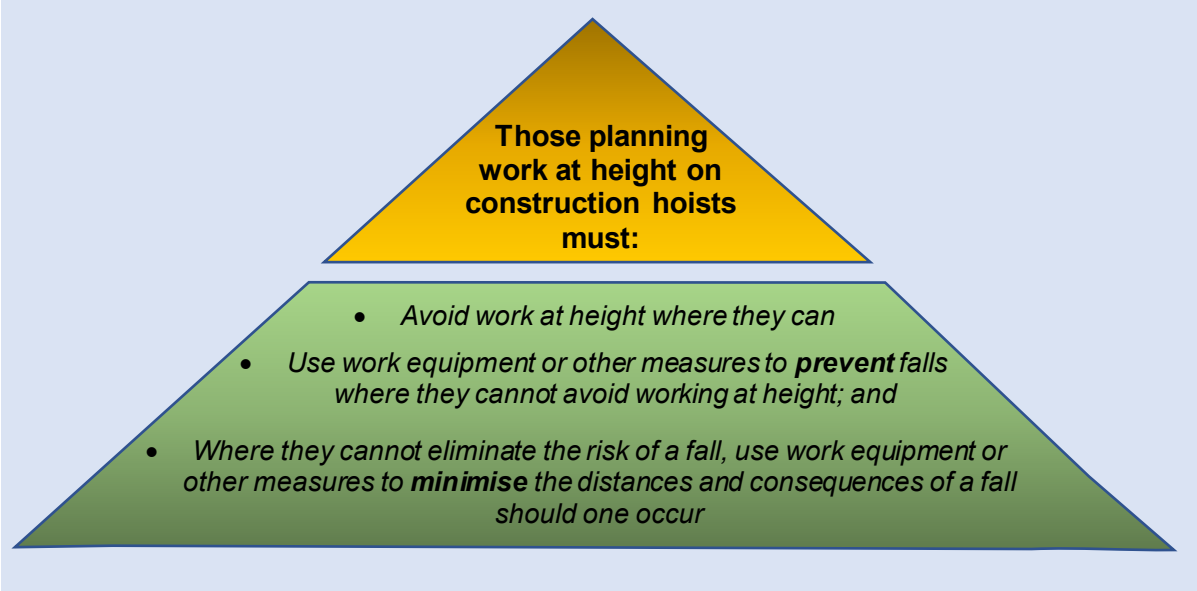

Figure A.3.1 hierarchy of fall protection measures

A4.12.0 *Isolation of Systems During Maintenance and Thorough Examination*

To avoid the risk of trapping, crushing, shearing or electrocution during the maintenance or thorough examination of mechanisms on construction hoists, all systems should be provided with a means of isolation. Where a system requires power maintenance for thorough examination, a safe system of work should be put in place to mitigate the risks of trapping. Such a safe system of work may well involve a 'permit to work' and should identify the lead person who is supervising the work. It should also specify adequate communication between the person operating the hoist and other members of the maintenance or thorough examination team.

A4.13.0 *Access for Examination of Bases, Ties and Grillages*

The site should provide safe access routes to allow the competent person to examine bases, ties and grillages. Where necessary, bases should be well drained or kept dry by pumping.

NOTE: *Access will also be required for the operator to check these items as part of his daily checks.*

A4.14.0 *Communication Equipment*

Personnel carrying out maintenance or thorough examinations should be provided with an adequate means of communication, often hand-held portable radios/phones etc. to ensure that all members of the thorough examination team can communicate effectively with each other, the construction hoist operator and personnel on the ground.

NOTE: *Additional advice on radio communications is given in the CPA Technical Information Note TIN 017 - Radio Communication for Lifting Operations.*

A4.15.0 Additional Information

The Construction Plant-hire Association produces a series of Technical Information Notes (TINs) on the safe use, maintenance and thorough examination of construction hoists. These are available to download free of charge on the CPA web site at www.cpa.uk.net in the Construction Hoist Special Interest Group section. Other relevant documentation includes:

- Provision & Use of Work Equipment Regulations 1998/SI2306;
- L22 *Safe use of work equipment,* HSE Books;
- Lifting Operations & Lifting Equipment Regulations 1998/SI2307;
- L113 *Safe use of lifting equipment,* HSE Books;
- BS 7212:2016 – Code of Practice for the safe use of construction hoists.

Construction Hoist In-service Maintenance Checklist

Company		Site		
Date	Hoist Type	Serial No.	Hour Clock	O/S No.

KEY: A – in good order B – requires early attention C – requires immediate action D - Not applicable

		A	B	C	D
ENCLOSURE	1. Side-panels				
	2. Cable basket(s) & trailing cable(s)				
	3. Electrical panel				
	4. Ultimate limit ramps				
	5. Isolators				
	6. Gate/door				
	7. Foundation fixing				
	8. Buffer springs				
	9.				
PLATFORM / CAGE	10. Gate, door entrance				
	11. Gate, door exit				
	12. Side panels, roof and floor				
	13. Ladder and fixing				
	14. Limit switches for gates/doors				
	15. Limit switch for trap door				
	16. Ultimate limit switch				
	17. Up limit switch				
	18. Down limit switch				
	19. Control switch/buttons				
	20. Electrical equipment				
	21. Counterweight, rope anchorage				
	22. Safety notices/signs				
	23. Lighting				
	24. Gate counterweight and ropes				
	25.				
MACHINERY	26. Guide roller, hook assemblies				
	27. Guide roller adjustment				
	28. Guide roller wear				
	29. Safety device unit				
	30. Safety device resetting tool				
	31. Drive motors				
	32. Brakes				
	33. Brake adjustment				
	34. Gearboxes				
	35. Gearbox oil levels				
	36. Drive pinions				
	37. Drive pinion wear				
	38. Drive pinion adjustment				
	39. Safety pinion				
	40. Safety pinion wear				
	41. Safety pinion adjustments				
	42. Centrifugal weights				
	43.				

		A	B	C	D
STRUCTURE	44. Mast sections				
	45. Mast bolts and nuts				
	46. Mast racks and bolts				
	47. Rack lubrication				
	48. Cable guides standard				
	49. Cable guide device & trolley				
	50. Landing beams				
	51. Pipe supports				
	52. Wall ties and fixings				
	53. Vertical pipes				
	54. Limit cams - top				
	55. Limit cams - bottom				
	56. Cable anchorages				
	57. Erection crane and accessories				
	58.				
GATE DOORS	60. Landing gates door				
	61. Mechanical interlocks				
	62. Gate cam & switch assembly				
	63. Hoistway protection				
	64.				
COUNTER-WEIGHTS	65. Counterweight assembly				
	66. Rope anchorages				
	67. Cathead sheaves				
	68. Guide rollers				
	69. Buffer springs				
	70. Support ropes				
	71.				
SPECIAL EQUIPMENT	72. External call system				
	73. Emergency stop control				
	74. Alarm system				
	75. Stop next landing				
	76. Load sensing				
	77. H frame clips				
	78. Emergency lowering				
	79. No undue noises				
	80. Guards replaced & secure				
	81.				
	82. Load control test				
	84. Load test				
	85. Drop test				
	86. Site register signature				
	87. Report of thorough examination				
	88.				

Notes

Name	Company	Signature

Annex 6 - Daily Pre-use Checks

Construction Hoist Daily Pre-use Checklist and Report

Week Commencing	Company	Site

Hoist Type	Serial No.	Plant No.

Key: ✓ = in good order ✗ = defect

Hoist Item	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Ropes correctly positioned on sheaves							
Operation of cage flaps, gates & interlocks							
Operation of landing flaps, gates & interlocks							
Roof trapdoor & interlock (passenger hoist)							
Base enclosure gates & interlocks							
Hoistway clear of obstructions							
Mast ties are secure (no undue movement)							
Check operating controls							
Emergency controls (except safety brake)							
Mains isolator switch operation & condition							
Operation of upper & lower limit switches							
Operation of trailing cable storage system							
Check cable guide springs are intact							
Check brake operates normally							
No unusual noises from motor, gearbox etc.							
Notices - instruction, operating & warning							
Leakage from any fuel system							
Condition of fuel container & security of cap							
Operation of audible or visual warning alarms							
Communication system cage to ground level							
Debris in base enclosure & on cage roof							
Initials of person carrying out checks							

Details of defects found & repairs		
Name of Appointed Person	Signature	Company

Construction Hoist Weekly Inspection Checklist and Report

Date	Company	Site
Hoist Type	Serial No.	Plant No.

All daily checks to be carried out prior to weekly inspection

Key: 4 = in good order R = repaired fault 8 = defect

Hoist Item	**4, R or 8**
Inspect structure for damage, e.g. bent mast bracings or ties, indentations on mast guides, cracked welds, loose bolts & fasteners	
Hoist rope for obvious signs of damage, excessive wear or corrosion	
Wire rope terminations, pins & retaining devices for damage, correct position & security	
Check sheaves, pulleys & drums for damage & that bushes are not worn or seized	
Rack and pinion for engagement, undue wear, damage and lubrication	
Inspect gearbox for leaks	
Check that tie bolts are secure with undue movement	
Check foundation bolts, rack retaining bolts and other bolts are fitted & secure	
Check guide rollers are correctly positioned and operational	
Check brake & clutch friction linings & drum paths for wear & that brakes are effective	
Check hoistway protection & machinery guards & fastenings are in place & secure	
Electrical cables - check for damage and bare wires	
Plugs & sockets - check for condition, cracks, bent pins and debris or dirt in sockets	
Cables - for taped or non-standard joints	
Check that cable covering has not been pulled out of plug or equipment grips	
Check casing of electrical equipment for damage & loose or missing parts & screws	
Check electrical equipment for contamination by oil, grease, water or dirt	
Check cables, plugs and equipment for overheating or burn marks	
Check any RCD power breaker by operating test button	
Visually check overspeed safety device	

Details of defects found & repairs - inform appointed person

Contacted hoist supplier	Yes	No

Carried out by	Signature	Company

Annex 8 – Report of Thorough Examination

Construction Hoist Report of Thorough Examination

(As required by Lifting Operations and Lifting Equipment Regulations 1998 - Schedule 1)

Date of thorough examination:	Date of report:	Report No:	Date of last thorough examination:

Name & address of hirer/user:	Name & address of owner:
Description of equipment:	Makers name:

Date of manufacture:	Owners No & serial No:	Location of equipment:
Mast height:	Number of landing gates:	Number of ties:

Safe Working Load:	Test load applied:	Drop test carried out with:	Rated number of persons:	Safety device serial No:

Examination after installation/assembly at a new location: **Yes / No** Periodic examination 6 Monthly: **Yes / No** Periodic examination 12 Monthly: **Yes / No** Examination following alteration/repair Or exceptional circumstances: **Yes / No**	State if any parts were inaccessible: Particulars of other tests carried out during this thorough examination:
Is the equipment installed correctly: **NA / Yes / No**	Is the equipment safe to operate: **Yes / No**

Particulars of any defects, repair, renewal or alteration required which is or could become a danger to persons:	Date (time) the defect must be rectified:

I hereby declare that the equipment described in this report was thoroughly examined and was found to be free from any defect likely to affect safety, (unless otherwise stated above) and that the particulars are correct.

Name of competent person:	Signature:	Job title/qualification:
Name of authenticating person:	Signature:	Job title:

Address of competent person or his employer:

The next thorough examination will be due on or before:

Annex 9 - Thorough Examination of Wire Ropes

The examination of wire ropes as part of the thorough examination of a construction hoist should be based on the principles and requirements set out in BS ISO 4309:2017, *Cranes. Wire ropes. Care, maintenance, installation, inspection and discard.*

This document stresses the importance of examining critical areas of the rope such as:

- The termination points of both moving and stationary ropes;
- That part of the rope which passes through over sheaves or any erection crane block;
- In the case of hoists performing a repetitive operation, any part of the rope which lies over sheave(s) while the hoist is in a loaded condition;
- That part of the rope which lies over a compensating sheave;
- Any part of the rope which may be subject to abrasion by external features.

When examining ropes on a construction hoist, it is often quite difficult to examine some parts of the rope, particularly those parts of the rope that are continually passing over cathead and deflector sheaves. Consideration should be given to both the length of time that the hoist will be erected on a particular site and the age of the rope. It may well be appropriate to fit a new rope before erection to reduce the risk of rope failure.

During the planning of thorough examinations, the following points should be taken into consideration:

1. Where it is not possible to carry out an effective examination of all parts of a hoist or counterweight rope on an erected construction hoist, that part of the rope that cannot be accessed should be examined by the competent person on the ground **before** the winch is installed on the hoist. This will provide confirmation that the rope is in good condition at the time of erection. At the same time the state of lubrication of the rope should be assessed so that any necessary remedial action can be taken before the rope is installed on the hoist. Fitment of a new rope will negate the requirement for this examination;
2. Where it is not possible to examine all parts of a hoist or counterweight rope on an erected hoist, the competent person must specify, following pre-erection examination on the ground, the maximum period for which the rope may remain in service before full examination or replacement. In the case of a new rope fitted to the hoist at time of erection, the period must not exceed 12 months;
3. The competent person must be provided with the hoist or counterweight rope specification and history of usage before carrying out the thorough examination;
4. If a hoist or counterweight rope is found to be excessively greased - and hence not able to be properly examined, the rope must be cleaned prior to examination;
5. All signs of external corrosion should be followed up by detailed measurement of rope diameter in those parts of the rope where the corrosion is observed to assess any reduction of rope diameter which may indicate deterioration of the rope core;
6. The competent person should assess the state of rope lubrication and detail any requirements for additional lubrication on his report.

The results of any examination of wire ropes should be recorded.

Annex 10 – Example of Pre-delivery Checklist

Pre-Delivery Inspection Checksheet - Construction Hoist					
Contract:				Date:	
Hoist Number:				Number of Hours:	
Serial Number:				Plant Number:	
Hoist Type:					
TICK COLUMN UPON COMPLETION OF INSPECTION OR MARK ***N/A***					
ENCLOSURE	1 Side Panels		**STRUCTURE**	31 Mast sections	
	2 Cable basket(s) & trailing cable(s)			32 Mast bolts and nuts	
	3 Gate/door			33 Mast racks and bolts	
	4 Foundation fixing			34 Rack lubrication	
	5 Buffer springs			35 Cable guides standard	
	6 Foundation plate			36 Cable guide arm device & trolley	
	7			37 Landing Beams	
PLATFORM/CAGE	8 Gate door entrance			38 Main frames	
	9 Gate door exit			39 Wall ties, fixings & couplers	
	10 Side panels, roof and floor			40 Vertical pipes & pipe supports	
	11 Ladder and fixing			41 Erection crane and accessories	
	12 Safety notices/signs			42	
	13 Operator's Manual			43	
	14			44	
MACHINERY	15 Guide roller, hook assemblies		**GATE DOORS**	45 Landing gates	
	16 Guide roller adjustment			46 Mechanical interlocks	
	17 Guide roller wear			47	
	18 Safety device unit			48	
	19 Date to replace safety device		**ELECTRICAL**	49 **All electrical equipment and limit switches as per HEC1-2**	
	20 Safety device resetting tool				
	21 Gearboxes				
	22 Gearbox oil levels			50	
	23 Drive pinions			51	
	24 Drive pinion wear		**LOAD TESTS**	52 Drop test (100% WLL)	
	25 Drive pinion adjustment			53 Load test (100% WLL)	
	26 Safety pinion			54 Static Load Sensor Test (110%WLL)	
	27 Safety pinion wear				
	28 Safety pinion adjustments			55	
	29			56	
	30			57	
Confirmation of Inspection:					
Name (Print):			Signature:		

Pre-Delivery Electrical Inspection Checksheet - Construction Hoist			
Contract	Hoist Type	Plant No.	Serial No.
Wiring Diagram No.	Cable Length	Hour Meter Reading	Date

	Winding Resist	Brake Resist	Pad Thickness/Air Gap
Motor 1			
Motor 2			
Motor 3			

Main Panel		Base Panel	
Remote P/B Control		Main P/B Control	
Mast Switches		Mast Cover Switches	
Gate Switches		Ramp Switches	
Car Light		All plugs/sockets	
Safety Device		Base Surround	
Battery Charger		Battery	
Loadcell		Loadcell Amplifier	
Mains Cable Insulation Value		Earth Continuity	

Faults Found:

Parts Used:

Person/Persons Responsible for Test:

Annex 11 - Example of Record of Competent Person Monitoring

Record of Stage 1 Monitoring of a Competent Person (Installation Supervisor) Undertaking Thorough Examination of Goods Hoists with a Rated Capacity of 500kg or less.			
Competent Person:		*Employer:*	
Relevant Qualifications:			
Relevant Experience:			

Review of Thorough Examination Records

TE Report No.	*OK?*	*Issues*	*TE Report No.*	*OK?*	*Issues*

On-site Review

Hoist Make and Model:		*Date of Original TE:*	
Additional defects found during check TE:		*Date of Check TE:*	

Satisfactory Review?	Y/ N	*Action taken:*	

Overall Stage 1 Review Outcome:	Satisfactory/Unsatisfactory
Remedial Action Required:	

Monitor's Name:		*Position:*
Signature:		*Date:*

Record of Stage 2 Monitoring of a Competent Person (Installation Supervisor) Undertaking Thorough Examination of Goods Hoists with a Rated Capacity of 500kg or less.			
Competent Person:		*Employer:*	

Review of Thorough Examination Records

TE Report No.	*OK?*	*Issues*	*TE Report No.*	*OK?*	*Issues*

Review of Maintenance and Breakdown Records and Comparison with Reports of Thorough Examination

Details of Discrepancies:

On-site Review

Hoist Make and Model:		*Date of Original TE:*	
Additional defects found during check TE:		*Date of Check TE:*	

Satisfactory Review?	Y/ N	*Action taken:*	

Overall Stage 2 Review Outcome:	Satisfactory/Unsatisfactory

Remedial Action Required:

Monitor's Name:		*Position:*	
Signature:		*Date:*	

Record of Stage 3 Monitoring of a Competent Person (Installation Supervisor) Undertaking Thorough Examination of Goods Hoists with a Rated Capacity of 500kg or less.					
Competent Person:			*Employer:*		
Review of Thorough Examination Records					
TE Report No.	*OK?*	*Issues*	*TE Report No.*	*OK?*	*Issues*
Review of Maintenance and Breakdown Records and Comparison with Reports of Thorough Examination					
Details of Discrepancies:					
On-site Review					
Hoist Make and Model			*Date of Original TE*		
Additional defects found during check TE			*Date of Check TE*		
Satisfactory Review?	Y/N	*Action taken*			
Overall Stage 3 Review Outcome:	Satisfactory/Unsatisfactory				
Remedial Action Required:					
Monitor's Name:		*Position:*			
Signature:		*Date:*			

Annex 12 - Scaffold Hoists, Trestle/Beam Hoists and Inclined Hoists

Scaffold hoists, trestle/beam hoists and inclined hoists are commonly used throughout the construction industry. They can be easily transported to the site, are quickly erected, require little operating space and may be fitted with buckets, skips, platforms or cages.

Different models allow for basic height variations of between 8 metres and 30 metres, although much greater heights can be reached with extensions. Load capacity varies with the model but lifting capacity of 500 kg is not untypical.

All of these hoists come within the scope of The Lifting Operations and Lifting Equipment Regulations 1998 and although free standing, are subject to the same provisions as construction hoists that are tied to a structure.

Scaffold cranes or barrow hoists

These are lifting equipment within the meaning of the regulations and as with all lifting equipment must not be overloaded.

The attachment of scaffold hoists to scaffolds is critical and must be carried out in accordance with the manufacturer's instructions. Scaffold hoists should not be attached to scaffolds unless they have been designed to take the loads imposed by the scaffold hoist.

Maintenance, inspection and through examination should follow the requirements for construction hoists.

Trestle/beam hoists

These are lifting equipment within the meaning of the regulations.

They rely for their stability on counter weighting at the rear of the trestle frame and it is essential that adequate counterweights are supplied. Counterweight is often proved by filling bins attached to the frame with sand or gravel. Before using the hoist, checks should be made to ensure that sufficient material has been added to the bins and that they are in good condition so that the ballast cannot discharge unintentionally.

Maintenance, inspection and through examination should follow the requirements for construction hoists.

Inclined hoists

These are lifting equipment within the meaning of the regulations. They are particularly useful for trades such as bricklaying and traditional roofing and on a larger project, they have the potential to eliminate a significant amount of manual handling.

Inclined hoists are also known as roof tile or brick carriers. New developments include telescopic and slewing functions. Load capacities go up to 200 kg and lateral extensions may be up to 35 metres.

Inclined hoists are specifically designed for use at angles between 10° and 85° and they may also incorporate a hinged section to allow the hoist to follow the pitch of a roof.

They also provide flexible solutions to the problems of removing demolition waste in refurbishment situations. As they are in effect a conveyor belt system, care needs to be taken to ensure that the guards to the rollers are in place to ensure that fingers and/or clothing cannot be dragged in. These are so called ‘in-running nips’ and particularly where the motor driving the hoist is powerful, the potential for serious injury is significant.

Maintenance, inspection and through examination should follow the requirements for construction hoists.

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Construction Industry Training Board	www.citb.co.uk
Health and Safety Executive	www.hse.gov.uk
Lifting Equipment Engineers Association	www.leea.co.uk
Safety Assessment Federation	www.safed.co.uk
Strategic Forum for Construction	https://strategicforum.org.uk/
United Kingdom Accreditation Service (UKAS)	www.ukas.com
Build UK	www.builduk.org

Working Group Membership (2010)

Role	*Name*	*Employer*	*Representing*
Chairman	Gordon Gedling	Hoist-It Limited	Construction Hoist Interest Group
Member	Tony Baker	Allianz Cornhill Insurance	Safety Assessment Federation
Member	Geoff Beentjes	Hoist-It Limited	Construction Hoist Interest Group
Member	Nigel Bland	GB Access Limited	Construction Hoist Interest Group
Member	Adrian Bolton	Alimak-Hek Limited	Construction Hoist Interest Group
Member	Vaughan Cole	Health and Safety Executive	Health and Safety Executive
Member	Craig Hook	Sir Robert McAlpine	UK Contractors Group
Member	Keith Hancock	Geda UK	Construction Hoist Interest Group
Member	Alistair Jordan	Rapid Platforms Limited	Construction Hoist Interest Group
Member	Lee Mason	National Construction College	Construction Skills
Member	Haydn Steele	Construction Plant-hire Association	Construction Hoist Interest Group
Member	Ian Wallace	Bovis Lend Lease	UK Contractors Group
Secretary & Editor	Tim Watson	Construction Plant-hire Association	Construction Hoist Interest Group

Working Group Membership (2020/21 Revision)

Role	**Name**	**Employer**	**Representing**
Chairman	Kirsty Archbold-Laming	Southern Hoists	Construction Hoist Interest Group
Document reviewed by various members of the 2020 Construction Hoist Interest Group			
CPA Co-ordinator	Rob Squires	Construction Plant-hire Association	Construction Hoist Interest Group
Original Secretary & Editor	Tim Watson	Construction Plant-hire Association	Construction Hoist Interest Group
Co-Editor – Final publication	Ian Simpson	Construction Plant-hire Association	Construction Hoist Interest Group

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Construction Hoist Interest Group (CHIG)
Construction Plant-hire Association
27/28 Newbury St
London
EC1A 7HU
Telephone: 020 7796 3366
Email: enquiries@cpa.uk.net