

LIFTING EQUIPMENT ENGINEERS ASSOCIATION
Guidance on Written Schemes of Examination for Lifting Equipment
Document reference LEEA 032 dated 14.7.00

Introduction

The Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) permits a scheme of examination, drawn up by a competent person, as an alternative to the fixed maximum periods. Prior to LOLER, there was no history of examination schemes for lifting equipment. However for several years there have been schemes for pressure equipment which provide useful guidance.

The benefit of an examination scheme is that, by focusing on the most safety critical areas, the examinations can be carried out in the most cost effective way. This may provide a means of reducing examination costs, however it may also provide a means of enhancing safety without increased cost.

When an examination scheme is appropriate

An examination scheme is only appropriate when the advantages gained from the scheme outweigh the disadvantages. This is most likely under the following circumstances:

- (1) When the condition of the equipment depends primarily on the amount and/or nature of the usage and such usage can be monitored. For example if the equipment can be fitted with a time recorder which records the hours of service or if the tonnage lifted and moved can be calculated from production records.
- (2) When the condition of the various parts of the equipment deteriorates at markedly different rates. For example the structure of a turbine house crane normally used only on the auxiliary hoist will be very lightly stressed compared to the auxiliary hoist.
- (3) When equipment is only used occasionally and can be adequately quarantined and examined when required for used.

Conversely a periodic examination is more likely to be appropriate when:

- (1) The amount of use cannot easily or cost effectively be monitored.
- (2) When the equipment may deteriorate due to time and/or storage conditions whether used or not. For example natural fibre ropes.
- (3) When the equipment is vulnerable to damage each time it is used and the thorough examination is in effect a 'long stop' to detect any deterioration not noticed during the in-service inspection. For example a webbing sling.
- (4) The use pattern is well established and all parts subject to similar rate of deterioration.

Except when equipment is quarantined, an examination

scheme is unlikely to be appropriate for lifting accessories such as slings and shackles, or for portable lifting machines such as hand chain blocks, lever hoists and jacks.

Objectives of the examination scheme

The objective of the thorough examination is to check whether the equipment is fit for the coming period of service. Implicit in this is the objective that, given normal wear and tear and the forecast usage of the equipment, it should still be safe to use at the end of the period of service.

Clearly unforeseen events may occur which renders the equipment unsafe and LOLER makes provision for such eventualities by requiring inspection at suitable intervals between thorough examinations. The LEEA has long recommended inspection of lifting equipment before each use, particularly lifting accessories which can easily be damaged if misused.

The examination scheme should therefore ensure that all parts of the equipment upon which safety depends are thoroughly examined by appropriate means and at such frequency as will allow defects to be detected and remedial action taken before the equipment becomes dangerous.

The information which should be in the examination scheme

The written scheme of examination should contain at least the following information:

- (1) The name and address of the owner of the lifting equipment.
- (2) The name and contact details of the person responsible for the equipment. If responsibility is divided, eg between maintenance and operations, there may be more than one name. However it should be clear who should be notified in the event of a dangerous or potentially dangerous defect and to whom reports should be sent.
- (3) The name, qualifications and address of the person drawing up the scheme. If the competent person is not working on their own account, the name of their employing organisation and their position in that organisation should be given.
- (4) The identity of the equipment, ie a description including the make, model and unique identity number.
- (5) The location of the equipment if it is a fixed installation or the location where it is based for portable and mobile equipment.
- (6) Details of any information or references used in

drawing up the scheme. For example the manufacturer's manual, expected component life, or specific information on the design life of the crane structure and mechanisms as detailed in clause 7 of ISO 12482-1.

- (7) The basis for the scheme. For example, is it based on hours of service, duty monitoring, examining certain parts or components at different intervals to other parts?
- (8) Details of any data logging system fitted, including a list of the parameters monitored and the means of data retrieval, monitoring and storage.
- (9) What determines when the thorough examination shall take place and who is responsible for monitoring that and instigating the examination?
- (10) Identification of the safety critical parts requiring thorough examination.
- (11) A risk assessment. This should take account of:
 - (a) the condition of the equipment
 - (b) the environment in which it is to be used
 - (c) the number and nature of lifting operations and the loads lifted

It should include details of any assumptions about usage, expected component life etc.
- (12) The frequency of thorough examination of those parts identified as safety critical taking into account the degree of risk associated with each part. This may include time or loading or duty cycle limits and vary for different parts of the equipment.

(Note: Where the scheme is based on the hours of service we recommend that a maximum period between thorough examinations is always specified as equipment can deteriorate whether used or not.)
- (13) The method of examination of those safety critical parts, which may include the degree of dismantling required and the techniques employed eg visual examination, measurement, NDT, operational test, load test.
- (14) The rejection criteria or a reference to where this information may be found.
- (15) An indication of the resources required to prepare the equipment and carry out the thorough examination. This may include qualified personnel, workshop facilities, specialist NDT and metallurgical facilities.
- (16) Any changes to equipment condition, operational or environmental parameters that will require a review of the scheme by the competent person. These may include damage to the equipment, change of use from general duty to heavy duty or moving from an inland location to a marine environment.
- (17) A requirement for the person responsible for the equipment to monitor its circumstances of use and inform the competent person who drafted the scheme of any changes.
- (18) The date of drawing up the scheme and the date at which any routine review is required.

***Item 11 – Risk Assessment**

The basic requirements are contained in the ACoP to Regulation 9 of LOLER. The following are suggestions to expand upon the basic requirements:

(a) the condition of the equipment

Consider:

- Overall condition - older equipment may need more frequent monitoring particularly if fatigue or corrosion are beginning to set in. Additional tests, measurements or NDT techniques may be required at certain stages of its life.
- Component condition – items such as ropes may need more frequent monitoring towards the end of their expected life or at the onset of broken wires or other signs of defects.
- Short term condition – It may be possible that equipment with a defect can continue to be used until a repair can be made subject to more frequent or stringent monitoring.

(b) the environment in which it is to be used

Consider:

- Weather conditions if used outdoors including exposure to wind, rain and low temperatures;
- Corrosive environments such as salt water, exposure to fumes, chemicals, high temperatures;
- The effect of such environments on key components particularly whilst not in use eg brakes;
- The risk to the environment by the equipment eg explosive atmospheres;
- Mechanical damage during transport, storage, erection and dismantling;

(c) the number and nature of lifting operations and the loads lifted

Consider:

- Is it a frequent usage?
- Are the loads in the upper part of the load range?
- For lifting machines, are the lifts long or short and if short are they on the same length of chain/rope causing local wear?
- For lifting machines, what proportion of the work is lifting and travelling ie will one mechanism wear faster than another?
- Is it a well controlled lift or are shock conditions and overload possible?
- Does the load affect the lifting machine eg a hot load?