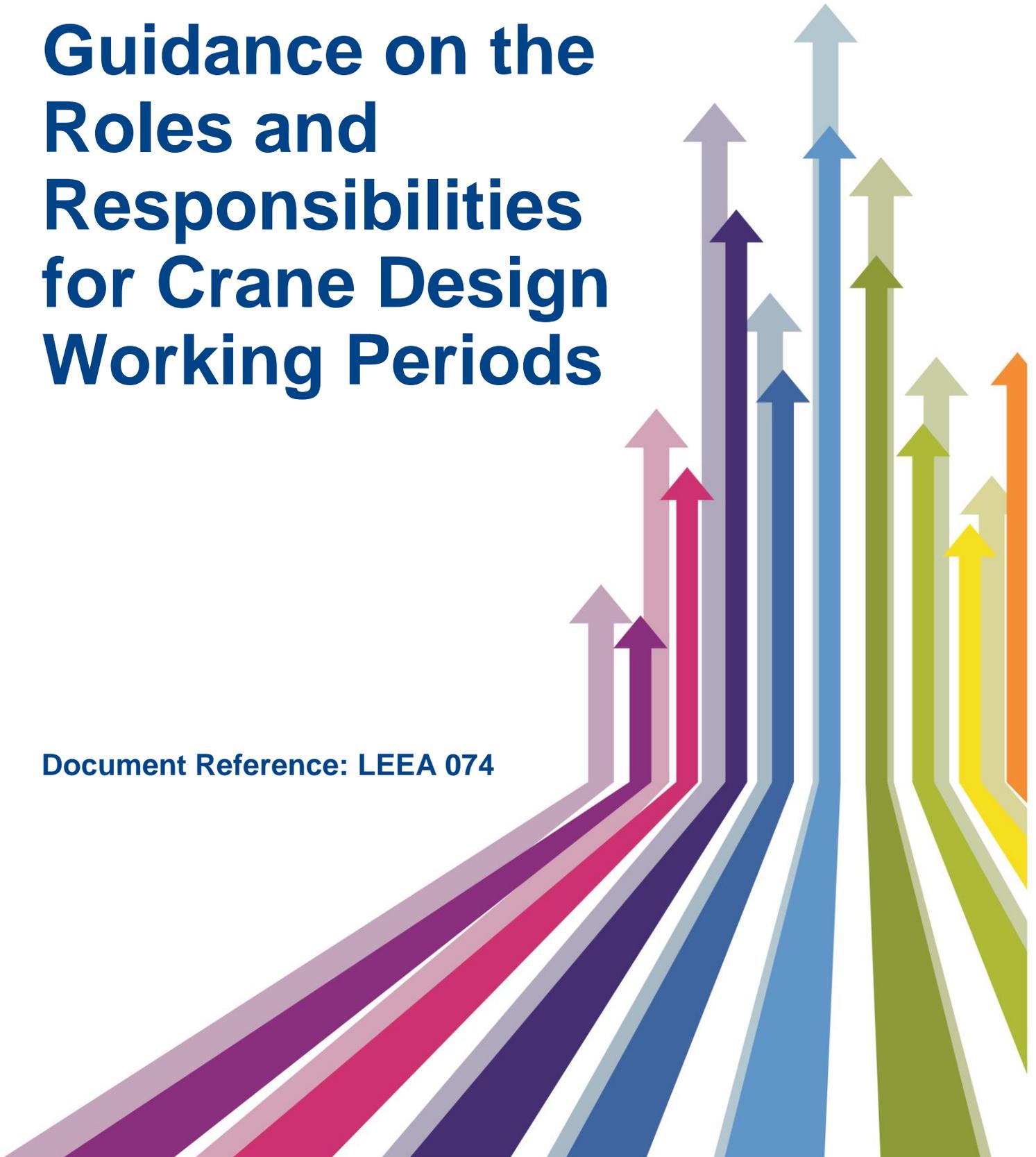


Guidance on the Roles and Responsibilities for Crane Design Working Periods

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(DWP)**

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1.0 Introduction.

Investigations of some crane failures over recent years has revealed that many are attributed to age related defects. Most of these failures could have been avoided if the age of the cranes had been properly assessed and appropriate inspection / maintenance measures had been put in place.

Cranes are designed for a finite lifetime duty, which is specified in load cycles and load spectrum and is not principally related to calendar working time. Classification of crane duty provides the crane owner a means to specify the intended duty in order to achieve the intended useful operational lifetime of the crane. It is important to note that cranes are not classified by load rating, but by utilisation (i.e. work cycles for structures and running hours for mechanisms) and the load spectrum (i.e. the amount of load handled by average compared to the nominal rated load). Therefore a crane with a low classification of crane duty may only be used for infrequently and / or for generally handling loads much lower than the rated capacity and only occasionally lifting loads at rated capacity.

Typically, industrial cranes are designed for operational periods between 10 to 20 years, however some special cranes may be designed for shorter or longer periods than this. If the actual crane duty does not exceed the designed duty, then it is possible for the manufacturer to estimate the time after which certain components should be replaced. Unfortunately, in many cases the actual duty of the crane will change during its life and therefore the useful operational lifetime will become an unknown variable.

The risk of crane failure increases when the crane exceeds its design life. Therefore, it is important that cranes are monitored to ensure that they are properly serviced before this period is exceeded. BS ISO 12482 specifies a method for monitoring, during long term operation, the actual duty of the crane, and a means of comparing this to the original duty which was specified through classification. Applying the monitoring methods described in this standard provides a tool for predicting the approach of the design limits and for focusing special inspections on critical areas of the crane.

The question is, who is responsible for ensuring that a crane is properly assessed, inspected and maintained with respect to its design life? The following sections identify key personnel who are responsible and the extent to which they are culpable.

2.0 Duty Holder.

The Provision and Use of Work Equipment Regulations (PUWER) and the Lifting Operations and Lifting Equipment Regulations (LOLER) require the duty holder to ensure that cranes are maintained, inspected and thoroughly examined to ensure that they are safe to use. They also require that the cranes selected should not be unduly susceptible to any of the foreseeable failure modes likely to arise in service, for example fracture, wear or fatigue. The regulations also make the duty holder responsible for keeping records of the crane use, adequate to determine the history of the crane and determine its remaining life. Such records would include maintenance, inspections, thorough examinations, repairs, modifications and exceptional circumstances.

Although it is the duty holder who is responsible for ensuring the above and other obligations imposed by these regulations are fulfilled, which include taking appropriate action when the DWP of the crane is reached, it is recognised that fulfilment of some of these obligations require a level of competency that many duty holders will not have. Therefore, it is common and accepted practice for duty holders to subcontract or delegate some of their duties to others.

If the duty holder opts to delegate some or all of their legal responsibilities to others, then this does not absolve them any responsibility, they still remain responsible for ensuring that the persons or organisations employed have the necessary knowledge, experience, training, skill and ability to perform the specific duty for which the requirement refers. This means that they are responsible for properly assessing / vetting the person(s) or organisation(s) they employ.

The duty holder is also responsible for ensuring that equipment being brought into their undertaking is fit for purpose. In terms of cranes this means using them within the applicable design parameters, or applying appropriate measures should the design parameters need to be exceeded.

2.1 Competent Person.

The term 'Competent Person' has long been used in legislation to describe a suitably knowledgeable and experienced person for a specific task. For the purpose of this document the term 'Competent Person' is used to describe the person responsible for the thorough examination of Cranes. This

person must have such practical and theoretical knowledge and experience of the crane which is to be thoroughly examined that will enable them to detect defects or weaknesses which it is the purpose of the examination to discover and assess their importance to the safety of the equipment.

For many safety critical components, for example load path/bearing items, safety devices such as rated capacity limiters and control systems, it is difficult for the competent person to visually examine without significant disassembly and in some cases it is not reasonably practical to do so. Therefore, to ensure the continued safety of the crane, the competent person must employ other investigative techniques.

Typically, the competent person will review the machine history file, manufacturers literature and the current application and utilisation. This information can then be used to ascertain the appropriate actions when compared with measurable information, such as the DWP. For example, if a crane is 18 years old and the maintenance records show that it had never been stripped down or overhauled, then comparison with the actual or estimated DWP may indicate that further investigation is required and whether or not the crane should be disassembled to allow for examination of internal components or, alternatively, the crane should be overhauled such that the components are replaced. Another example, that would yield the same results would be that of a crane that is not so old, but was originally installed for a light duty application, but is now being used at a higher duty.

Although the above makes it clear that the Competent Person has to take into the account the age of the crane when defining the scope of the thorough examination, they are not necessarily responsible for assessing the remaining DWP of each critical component unless contracted to do so by the duty holder. However, if their thorough examination highlights the need for such an assessment to be undertaken, then they shall advise the duty holder accordingly in their report.

From this assessment, it will be possible to estimate the remaining life of the crane. The use of condition monitoring systems improves the accuracy of this estimation and therefore it is generally recommended that the duty holder fit them, although there is no legal obligation to do so.

Once the crane has reached the end of its DWP the Competent Person would be responsible for doing a special assessment of the crane, which would go into much more detail than a statutory examination and would likely require disassembly. This is done to survey the condition of the crane and identify nature and extent of remedial actions necessary for the further safe use, i.e. general overhaul

It shall be noted that the Competent Person is not necessarily responsible for assessing the DWP, disassembling the crane, or overhauling it. However, they are responsible for identifying defects and potential defects due to shortfall in the maintenance regime or changes of use and reporting these issues, along with the time in which they need to be actioned, to the duty holder.

2.2 Inspector.

The Inspector is responsible for the interim inspections, as determined by the risk assessment, between thorough examination. This risk assessment uses the manufacturers details, the actual utilisation, the environmental conditions of use, etc. to identify critical components and assemblies to be inspected and the intervals between their inspections. This means that the risk assessment must also take into account the DWP of the crane, the cranes assemblies/sub-assemblies and components.

The inspector is not necessarily responsible for the risk assessment, unless contracted and competent to do so, and therefore not necessarily responsible DWP, but they do have a duty to ensure that they are working to a scope of inspection as defined by the risk assessment. If the inspector is not taking responsibility for the risk assessment, then it is the responsibility of the duty holder to ensure one has been done and personnel to which it applies are respectively competent. They are also not necessarily responsible for disassembling the crane or major overhaul, however it should be noted that inspections are often done at the same time as planned maintenance and in some cases the inspection and maintenance personnel are the same.

It is important that inspection personnel maintain records of each inspection done and ensure that any findings, recommendations or urgent actions are reported to the duty holder and made available to the Competent Person.

2.3 Maintenance Personnel.

Maintenance personnel are responsible for repairing faults as and when they occur, as requested by the inspector or competent person, as required by the manufacturers literature, or in accordance with a planned maintenance regime defined by the risk assessment. Planned maintenance would include major overhaul when the DWP of the crane has been reached.

Maintenance personnel are not necessarily responsible for assessing the DWP, unless contracted and competent to do so, but they do have a responsibility to ensure that one has been defined and that they do work to it.

Maintenance personnel should keep records of all maintenance activities in the form of a machine history file. This should be made available to the Competent Person upon request.

2.4 Operators.

It is an operator's responsibility to ensure that they use only cranes for which they have received training and in accordance with this training and the manufacturers literature. They are also responsible for pre-use checking and reporting of any changes in the operation of the crane, that may indicate a defect, to the inspection/maintenance personnel.

It is the responsibility of the operator to carry out any monitoring and recording as instructed to do so by the duty holder or person responsible for the DWP monitoring. Filling in boxes and ticking sheets only.

Their responsibility in terms of DWP is to ensure that they carry out any monitoring and recording required to identify when the DWP limit has been reached.

2.5 Modifiers.

Cranes, particularly OTCs, generally have a long service life during which they may be refurbished, modified and traded second hand. In any case, the modifier would be responsible for assessing the modified crane in terms of DWP based on the agreed utilisation and original manufacturer's literature.

The duty holder is required to supply all relevant historical information to assist in assessing the modified cranes DWP. If this information is incomplete or unknown, then the duty for DWP calculation is based on estimate or assumed to be according to design classification and design life reduced using the reduction factor specified in BS ISO 12482:2014.

It shall be noted that in addition to the DWP assessment the modifier is responsible for ensuring that the crane is thoroughly examined by a competent person before returning service. However, in some cases it may also be necessary to re-assess the crane in accordance with the essential health and safety requirements of applicable EU directives and issue a new EC Declaration of Conformity and CE marking. For further guidance, refer to LEEA 062 Guide to second hand, modified or refurbished cranes

2.6 Manufacturer.

The manufacturer is responsible for providing the duty holder with the classification data necessary for the DWP assessment. This information shall form part of the manufacturer's instructions for use, refer to LEEA 062.

The manufacturer shall also include in the instructions;

- Limits for exceptional conditions and loadings to which the crane is designed;
- A list of components and areas to be specially assessed;
- Methods and acceptance criteria for physical inspections, and
- Recommendations for a general overhaul in respect of findings in the special assessment.

This is the information that the Competent Person and Inspectors shall take into account when investing and assessing the crane as defined in sections 2.1 and 2.2.

3.0 Conclusion.

The previous sections briefly outline the roles and responsibilities in terms of DWP and it is clear that it is the duty holder that is ultimately responsible for ensuring that any cranes in their undertaking are overhauled or replaced, when the DWP limit is approached.

However, the duty holder can delegate some or all of their duties with respect to DWP to other suitably qualified personnel. Although this does not absolve the duty holder of his responsibilities, it does mean that those undertaking specific legal obligations on behalf of the duty holder, would also be culpable for any failure attributed to an inadequacy of their duties.

In short everyone involved in the use, maintenance, inspection and thorough examination of a crane has responsibilities in terms of DWP and therefore they are accountable for any failure attributed to an incompetency of their individual tasks.