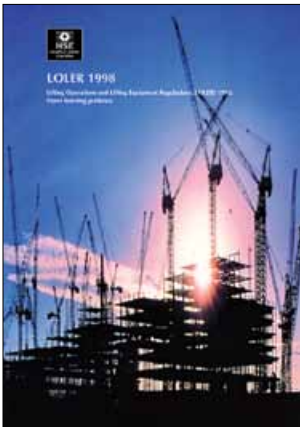


LOLER 1998

Lifting Operations and Lifting Equipment Regulations (LOLER) 1998: Open learning guidance



This is a free-to-download, web-friendly version of ISBN 978 0 7176 2464 5 (First edition, published 1999). This version has been adapted for online use from HSE's current printed version.

You can buy the book at www.hsebooks.co.uk and most good bookshops.

ISBN 978 0 7176 2464 5
Price £15.95

This guidance explains the Lifting Operations and Lifting Equipment Regulations (LOLER) 1998. The LOLER Regulations aim to make life safer for everyone using and coming into contact with lifting equipment.

The book describes each regulation in turn. It contains text from the regulations, as well as case studies, key terms, activities and self-assessment questions.

You should use this book if you are a local authority health and safety inspector, local authority enforcement officer, health and safety professional, HSE inspector or legal professional. Anyone who wants to know more about LOLER 1998 will also find this guidance useful.

© *Crown copyright 1999*

First published 1999
Reprinted 2008

ISBN 978 0 7176 2464 5

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise) without the prior written permission of the copyright owner.

Applications for reproduction should be made in writing to:
The Office of Public Sector Information, Information Policy Team,
Kew, Richmond, Surrey TW9 4DU or e-mail: licensing@opsi.gov.uk

This guidance is issued by the Health and Safety Executive. Following the guidance is not compulsory and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance as illustrating good practice.

Contents

Introduction	4
The Regulations	6
Regulations 1–3 Setting the scene	7
Regulation 1 Citation and commencement	8
Regulation 2 Interpretation	9
Regulation 3 Application	11
Regulation 4 Strength and stability	15
Regulation 5 Lifting equipment for lifting persons	23
Regulation 6 Positioning and installation	28
Regulation 7 Marking of lifting equipment	34
Regulation 8 Organisation of lifting operations	40
Regulation 9 Thorough examination and inspection	55
Regulation 10 Reports and defects	63
Regulation 11 Keeping of information	66
Regulation 12 Exemption for the armed forces	68
Regulation 13 and 14 Amendments to other Regulations: Shipbuilding and Ship-repairing Regulations 1960; Docks Regulations 1988	69
Regulations 15 and 16 Repeal of provisions in other Acts: the Factories Act 1961; section 85 of the Mines and Quarries Act 1954	70
Regulation 17 Revocation of instruments	71
Schedule 1 Information to be contained in a report of a thorough examination	72
Schedule 2 Revocation of instruments	73
Feedback and answers	75
Further information	82

Introduction

About this LOLER open learning guidance

This guidance explains the Lifting Operations and Lifting Equipment Regulations (LOLER) 1998. It aims to help you learn about and understand the Regulations dealing with the lifting equipment in use every day in workplaces: factories, offices, shops, hospitals, construction sites, warehouses, farms – wherever lifting equipment is used at work.

Aims

The LOLER Regulations aim to make working life safer for everyone using and coming into contact with lifting equipment: employers and employees, contractors and others. Like all regulations, they need to be studied closely. The words have been chosen carefully and sometimes have a precise legal meaning. At other times, you need to interpret the Regulations according to your own situation.

The guidance aims to clarify when terms are used precisely and when you need to interpret and apply the requirements of a regulation to your situation.

Who it's for

The main groups for whom this guidance is intended are:

- local authority health and safety inspectors;
- local authority enforcement officers;
- health and safety professionals who provide services within medium-sized to large companies, for example health and safety officers and health and safety training personnel;
- HSE inspectors; and
- legal professionals.

But anyone who wishes to know the requirements of LOLER 1998 should find this guidance useful.

How to use it

You can cover the content in your own time and pace, either working through in sequence, or selecting specific regulations as you need to know more.

Make sure that you have a copy of *Safe use of lifting equipment. Lifting Operations and Lifting Equipment Regulations 1998. Approved Code of Practice and Guidance L113 (LOLER ACOP)* when working through this open learning guidance.

Structure

Each regulation is described as follows:

Key points

A summary of the main coverage of the regulation.

The text of the regulation

The wording of the regulation is given verbatim; it has been drawn up by the Secretary of State for the Environment, Transport and the Regions, and by Parliament, and will be enforced by health and safety inspectors. It is precise and written in a formal style. In the regulation, note that use of the word 'he' refers to both men and women, singular and plural.

Main commentary

The regulation is described in more detail, taking you through each part and giving practical examples. Sometimes the words IF, AND, BUT, OR and NOT appear in capital letters. This is because a great deal of law is based on what might happen (IF . . . and sometimes AND), and it also has to take account of exceptions (BUT), alternatives (OR), and prohibitions (NOT).

For some regulations there is also:

- the full version of the LOLER Approved Code of Practice (ACOP), which gives specific advice on what employers must do to comply with the regulation;
- practical further information on some of the terms used in the Regulations;
- brief explanations of the kinds of precautions that employers should take and how the Regulations should be applied.

Case studies

Real-life situations in a variety of industrial and commercial sectors are used to illustrate what could happen if the requirements of the regulation are not met.

Key terms

Important words and phrases used in each regulation are defined.

Activity

A practical task is provided to help you understand the regulation and apply it to your situation. The feedback to the activity gives additional information and things to think about. (Note that there is no activity for regulations 1–3, and 10–17.)

Self-assessment questions (SAQs)

These are provided to test your understanding of each regulation. You could use the questions before and after reading about the regulation to compare your progress. (There are no self-assessment questions for regulations 12–17.)

The Regulations

HSE has brought out two sets of Regulations, which implement the Amending Directive to the Use of Work Equipment Directive (AUWED).

The Lifting Operations and Lifting Equipment Regulations 1998 (LOLER), the subject of this open learning guidance, is one set and came into force on 5 December 1998. The 17 regulations of LOLER apply to all lifting equipment used in the workplace, whether it is used to lift loads or people. All sectors of industry are affected by LOLER.

The other set of Regulations is the Provision and Use of Work Equipment Regulations 1998 (PUWER) which also came into force on 5 December 1998. It implements the general non-lifting requirements of the Directive and replaces the Provision and Use of Work Equipment Regulations 1992 in their entirety. Separate open learning training guidance is available for this set of Regulations.

PUWER applies to all work equipment, including lifting equipment. LOLER deals with the lifting risks where they exist.

To obtain a copy of the Statutory Instrument (the Regulations) contact:

The Stationery Office, PO Box 29, Norwich NR3 1GN
Tel: 0870 600 5522
Fax: 0870 600 5533
e-mail: customer.services@tso.co.uk
Website: www.tso.co.uk (They are also available from bookshops.)
Statutory Instruments can be viewed free of charge at www.opsi.gov.uk.

Safe use of lifting equipment, the associated Approved Code of Practice and Guidance (ACOP) includes the text of the Regulations and can be purchased from:

HSE Books, PO Box 1999, Sudbury, Suffolk CO10 2WA
Tel: 01787 881165
Fax: 01787 313995
Website: www.hsebooks.co.uk (HSE priced and free publications can be viewed online or ordered from www.hse.gov.uk or contact HSE Books. HSE priced publications are also available from bookshops.)

For general information on these Regulations and any matter relating to health and safety, ring HSE's Infoline Tel: 0845 345 0055
Fax: 0845 408 9566
Textphone: 0845 408 9577
e-mail: hse.infoline@natbrit.com or write to HSE Information Services, Caerphilly Business Park, Caerphilly CF83 3GG.

Regulations 1-3 Setting the scene

Key points

Regulations 1, 2 and 3 set down the legal requirements, which enable LOLER to be put into force. They govern:

- the title of the Regulations;
- when the Regulations come into force;
- the interpretation and meaning of particular terms;
- the geographical areas covered by LOLER;
- those to whom LOLER applies – the duty holders;
- the work situations in which LOLER applies.

Regulation 1

Citation and commencement

Regulation 1 states:

These Regulations may be cited as the Lifting Operations and Lifting Equipment Regulations 1998 and shall come into force on 5th December 1998.

Please note that duty holders:

- must have complied with the Regulations from the commencement date – 5 December 1998;
- must arrange for any lifting equipment, for which they are responsible, to be thoroughly examined by a competent person; if it was examined before 5 December 1998, it will not require a further examination until the date indicated by the competent person (or until the validity of the examination report expires).

Regulation 2 Interpretation

Regulation 2 states:

(1) In these Regulations, unless the context otherwise requires –

“the 1974 Act” means the Health and Safety at Work etc Act 1974;

“the 1992 Regulations” means the Supply of Machinery (Safety) Regulations 1992**(a)**;

“accessory for lifting” means work equipment for attaching loads to machinery for lifting;

“EC declaration of conformity” means a declaration which complies with –

(a) regulation 22 of the 1992 Regulations;

(b) Article 12.1 of Council Directive 89/686/EEC**(b)** on the approximation of the laws of the Member States relating to personal protective equipment;
or

(c) Regulation 8(2)(d) of the Lifts Regulations 1997**(c)**;

“employer” except in regulation 3(2) and (3) includes a person to whom the requirements imposed by these Regulations apply by virtue of regulation 3(3) (a) and (b);

“essential requirements” has the same meaning as in the Provision and Use of Work Equipment Regulations 1998**(d)**;

“examination scheme” means a suitable scheme drawn up by a competent person for such thorough examinations of lifting equipment at such intervals as may be appropriate for the purpose described in regulation 9(3);

“the Executive” means the Health and Safety Executive;

“lifting equipment” means work equipment for lifting or lowering loads and includes its attachments used for anchoring, fixing or supporting it;

“lifting operation” has the meaning given in regulation 8(2);

“load” includes a person;

“thorough examination” in relation to a thorough examination under paragraph (1), (2) or (3) of regulation 9 –

(a) means a thorough examination by a competent person;

(b) where it is appropriate to carry out testing for the purpose described in the paragraph, includes such testing by a competent person as is appropriate for the purpose;

and “thoroughly examined” shall be construed accordingly;

“work equipment” means any machinery, appliance, apparatus, tool or installation for use at work (whether exclusively or not).

(2) Unless the context otherwise requires, any reference in these Regulations to –
(a) a numbered regulation or Schedule is a reference to the regulation or
Schedule in these Regulations so numbered; and
(b) a numbered paragraph is a reference to the paragraph so numbered in
the regulation or Schedule in which the reference appears.

- (a)** SI 1992/3073 to which there are amendments not relevant to these Regulations.
- (b)** OJ No. L399. 30.12.89, p.18; printed in the Schedule to SI 1992/3139.
- (c)** SI 1997/831.
- (d)** SI 1998/2306.

You need to know:

- the wide range of equipment, from an eyebolt to a tower crane, that comes within the scope of LOLER; you must have a good grasp of all the definitions given in regulation 2 including the meaning of the term 'load', and what 'load' includes;
- examples of equipment which raise or lower loads and examples of accessories for lifting such as chains, ropes, slings which are covered by LOLER;
- that LOLER may be relevant to equipment which presents risks similar to traditional lifting equipment, for instance a front-end loader on a tractor, a bath hoist in a nursing home, ropes used for climbing and positioning during arboriculture, for climbing telecommunications towers to work on overhead lines and for examining rock or building surfaces;
- what operations are NOT covered by LOLER, for example any unassisted manual handling operation.

LOLER is aimed at the type of equipment that was covered by previous lifting regulations and also at lifting equipment which presents similar risks. LOLER also applies in any industries using this kind of equipment, including agriculture, which did not previously have any specific legislation covering lifting operations.

Regulation 3 Application

Regulation 3 states:

(1) *These Regulations shall apply –*

- (a) *in Great Britain; and*
- (b) *outside Great Britain as sections 1 to 59 and 80 to 82 of the 1974 Act apply by virtue of the Health and Safety at Work etc Act 1974 (Application outside Great Britain) Order 1995(a) (“the 1995 Order”).**

(2) *The requirements imposed by these Regulations on an employer in respect of lifting equipment shall apply in relation to lifting equipment provided for use or used by an employee of his at work.*

(3) *The requirements imposed by these Regulations on an employer shall also apply –*

- (a) *to a self-employed person, in respect of lifting equipment he uses at work;*
- (b) *subject to paragraph (5), to a person who has control to any extent of –*
 - (i) *lifting equipment;*
 - (ii) *a person at work who uses or supervises or manages the use of lifting equipment; or*
 - (iii) *the way in which the lifting equipment is used, and to the extent of his control.*

(4) *Any reference in paragraph (3)(b) to a person having control is a reference to a person having control in connection with the carrying on by him of a trade, business or other undertaking (whether for profit or not).*

(5) *The requirements imposed by these Regulations on an employer shall not apply to a person in respect of lifting equipment supplied by him by way of sale, agreement for sale or hire-purchase agreement.*

(6) *Subject to paragraphs (7) to (10), these Regulations shall not impose any obligation in relation to a ship’s work equipment (whether that equipment is used on or off the ship).*

(7) *Where merchant shipping requirements are applicable to a ship’s work equipment, paragraph (6) shall relieve the shore employer of his obligations under these Regulations in respect of that equipment only where he has taken all reasonable steps to satisfy himself that the merchant shipping requirements are being complied with in respect of that equipment.*

(8) *In a case where the merchant shipping requirements are not applicable to the ship’s work equipment by reason only that for the time being there is no master, crew or watchman on the ship, those requirements shall nevertheless be treated for the purpose of paragraph (7) as if they were applicable.*

(9) *Where the ship’s work equipment is used in a specified operation paragraph (6) shall not apply to regulations 6 and 8 (each as applied by regulation 3).*

(10) Paragraph (6) does not apply to a ship's work equipment provided for use or used in an activity (whether carried on in or outside Great Britain) specified in the 1995 Order save that it does apply to –

- (a) the loading, unloading, fuelling or provisioning of the ship; or
- (b) the construction, reconstruction, finishing, refitting, repair, maintenance, cleaning or breaking up of the ship.

(11) In this regulation –

“master” has the meaning assigned to it by section 313(1) of the Merchant Shipping Act 1995**(b)**;

“merchant shipping requirements” means the requirements of regulations 3 and 4 of the Merchant Shipping (Guarding of Machinery and Safety of Electrical Equipment) Regulations 1988**(c)** and regulations 5 to 10 of the Merchant Shipping (Hatches and Lifting Plant) Regulations 1988**(d)**;

“ship” has the meaning assigned to it by section 313(1) of the Merchant Shipping Act 1995 save that it does not include an offshore installation;

“shore employer” means an employer of persons (other than the master and crew of any ship) who are engaged in a specified operation;

“specified operation” means an operation in which the ship's work equipment is used –

- (a) by persons other than the master and crew; or
- (b) where persons other than the master and crew are liable to be exposed to a risk to their health or safety from its use.

(a) SI 1995/263.

(b) 1995 c.21.17

(c) SI 1988/1636, amended by SI 1998/2274.

(d) SI 1988/1639, amended by SI 1988/2274.

* Revoked by the Health and Safety at Work etc Act 1974 (Application outside Great Britain) Order 2001 (SI2001/2127).

Where LOLER applies

LOLER generally applies throughout Great Britain, and wherever the Health and Safety at Work etc Act 1974 applies. In some cases, LOLER may apply on board sea-going ships where persons other than the master and crew are liable to be exposed to risks from the use of the lifting equipment. The Health and Safety at Work Act (Application outside Great Britain) Order 2001 extends the Regulations to all offshore activities and sub-sea installations on the Great Britain continental shelf. Therefore, LOLER applies to these activities.

How LOLER applies

LOLER applies to the way lifting equipment is used in commerce and industry. It applies to employers and self-employed persons providing lifting equipment for use at work and those in control of the use of lifting equipment. LOLER applies only to work activities, for example:

- a crane on hire to a construction site;
- a contract lift;
- a passenger lift provided for the use of workers in an office block;
- refuse collection vehicles (lifting on public roads);
- patient hoists;
- fork-lift trucks.

Summary

The ACOP for LOLER focuses on:

- risk assessment requirements which apply;
- factors to be considered if risks mean that LOLER applies;
- the fact that the aim of LOLER is to reduce risks.

There is no regulation requiring a risk assessment in LOLER. This is because of the existing risk assessment requirements in the Management Regulations. The main factors to take into account are the severity of any injury or ill health likely to result from any hazard present, the likelihood of that happening and the numbers exposed. You may find it helpful to read the HSE guidance in *Five steps to risk assessment*.⁽¹⁾

The ACOP also covers details about:

- the material of manufacture of lifting equipment;
- the means of access to or egress from any part of the lifting equipment;
- protection against slips, trips and falls;
- operator protection;
- effects of high wind.

The ACOP says:

Protection against slips, trips and falls

68 Where a person is required to be present on any part of the lifting equipment, eg for operational, maintenance or inspection purposes, the working place, particularly if a platform, for that activity should be such as to minimise the risks of accidents arising from slips, trips and falls.

Operator protection

83 Where operators may be adversely affected by the environment in which they are using the lifting equipment you should provide them with adequate protection.

Self-assessment questions

- 1 What are these Regulations called?
- 2 When did they come into force?
- 3 What is an 'EC declaration of conformity'?
- 4 What is meant by 'the Executive'?
- 5 Lifting equipment is _____.
- 6 LOLER applies: (please select one)
 - (a) only in Great Britain;
 - (b) in and outside Great Britain;
 - (c) wherever the Health and Safety at Work etc Act 1974 applies.
- 7 LOLER applies to employers, employees and self-employed people who use lifting equipment. TRUE or FALSE?
- 8 Does LOLER apply to those who supply lifting equipment for sale or hire purchase?
- 9 What does LOLER require of shore employers regarding work equipment used on merchant ships?
- 10 LOLER applies to the loading, unloading, fuelling or provisioning of ships. TRUE or FALSE?
- 11 The term 'ship' includes offshore installations. TRUE or FALSE?
- 12 A 'specified operation' is _____.
- 13 As far as an employer is concerned, what lifting equipment is covered by LOLER?
- 14 What other individuals have duties under LOLER?

Answers on page 75.

Regulation 4

Strength and stability

Key points

This regulation is about the adequacy of lifting equipment to carry out lifting operations safely. It focuses on the strength of the component parts of the lifting equipment, and stability in the whole lifting system. It places a duty on employers to ensure, according to the load involved and the circumstances of the lifting operation, that only equipment which is strong enough and sufficiently stable is used.

Regulation 4 considers the safety risks of lifting equipment that could fail or collapse under load because of:

- inadequate physical strength of any part of the equipment; OR
- instability in the lifting system.

The regulation has two parts:

- 4(a) focuses on strength and stability;
- 4(b) is about the load being lifted.

Regulation 4(a) is supported by the ACOP in the following areas:

- strength of the lifting equipment;
- stability – the forces involved and measures to prevent overturning;
- the prevention of overload.

Regulation 4 states:

Every employer shall ensure that –

- (a) lifting equipment is of adequate strength and stability for each load, having regard in particular to the stress induced at its mounting or fixing point;*
- (b) every part of a load and anything attached to it and used in lifting it is of adequate strength.*

Key terms

Lifting equipment	Equipment, including accessories, which is designed and used for carrying loads.
Strength	The capability of materials and components of the equipment to withstand the loads and forces applied.
Stability	The ability of the equipment to remain fixed in its normal position for use.
Load	The total weight to be lifted, including all the accessories.
Mounting or fixed point	The points at which lifting equipment is held secure to another surface or where parts of the equipment are fixed together.

Adequate strength of lifting equipment

The requirements for adequate strength of lifting equipment are explained in the ACOP especially the need for:

- forces and weights to be considered, including the aggregated weight to be lifted;
- failure modes;
- equipment selected for lifting to be appropriate to, and compatible with, the circumstances and conditions of use;
- a factor of safety.

Employers must be able to show they have taken ALL these into account.

The ACOP says:

Adequate strength

98 You should assess whether the lifting equipment has adequate strength for the proposed use. Account should be taken of the combination of forces to which the lifting equipment will be subjected as well as the weight of any associated accessories used in the lifting operation.

99 The lifting equipment selected should not be unduly susceptible to any of the foreseeable failure modes likely to arise in service, for example fracture, wear or fatigue.

100 The lifting equipment used should provide an appropriate factor of safety against failure under foreseeable failure modes.

You need to note that:

- adequate strength applies to the whole lifting system, including fixing or mounting systems;
- the forces and additional stresses in equipment used in different configurations need to be considered;
- material that fails must fail in a ductile manner (see Key terms, page 15);
- a competent person needs to ensure that the strength and stability of the lifting equipment is always adequate for the tasks it is used for;
- equipment manufacturers or suppliers may need to be contacted for advice if the lifting equipment is to be used for difficult or unusual lifts.

Case study: Residential care home

Local authority enforcement officers were called to an old mansion undergoing conversion to a residential care home for the elderly. A stairlift was being installed. The equipment installation contractor was in dispute with the home's owner who had instructed that the chairlift track running the length of the staircase was to be fixed to the existing ornamental banisters. The contractor claimed that this would be unsuitable because the banisters were cast iron, a brittle material, unsuitable for supporting lifting equipment. The inspectors endorsed the contractor's claim and explained to the owner that the banisters, if overloaded, would be liable to break suddenly, causing the chairlift track to be detached. An alternative arrangement using steel anchor plates in the staircase was proposed and the installation work continued.

Case study: Public carriageway

A member of the public was crushed when a crane jib collapsed onto a van she was driving. The crawler tracked crane, which was being used for constructing a sea wall nearby, was fitted with a 42.7-metre main jib plus a 12.2-metre fly jib. While the crane was being manoeuvred, the jib started and continued to rise. Its root welds failed and the jib collapsed over the back of the crane. Because of the nature of the tracks and methods of controlling the crane, the movement was jerky, causing high inertia loads on the jib system. These, in addition to high loads on the jib due to over-travel, caused the welds on a backstop to fail.

Key terms

Combination of forces	The combined effect of all forces acting on the lifting equipment including those which are static (eg weight) and those caused by movement of the equipment or its load.
Accessories	Subsidiary items of equipment used in the lifting operation (eg chains, slings, blocks).
Factor of safety	Additional strength over and above what is needed in theory to ensure safety.
Ductile manner of failure	Gradual failure; depends on the properties of the construction material used.
Failure modes	The ways in which engineering materials characteristically fail, depending on the circumstances and conditions of the application.

Adequate stability of lifting equipment

The ACOP deals with the requirement for adequate stability in lifting equipment, first by noting the general need to prevent equipment in use from overturning and to provide stabilising measures; it then concentrates on the particular needs of certain categories of equipment which are at risk of stability problems:

- mobile equipment;
- equipment assembled and dismantled on-site;
- equipment which operates on rails;
- equipment which runs on pneumatic tyres.

Employers need to assess equipment for stability on the basis of all factors which could come into play. Equipment should be selected which is inherently stable, by design. If the circumstances of a particular lifting operation might put stability at risk, then additional stabilising measures must be taken.

Preventing overturning and stability measures

The ACOP says:

Adequate stability

104 You should ensure the lifting equipment has adequate stability for its proposed use. You should take account of any combination of destabilising forces that may adversely affect the stability of lifting equipment.

105 Where appropriate, you should take suitable effective measures to provide sufficient resistance to overturning in order to ensure the adequate stability of the lifting equipment.

106 Where the safe use of the lifting equipment depends on the use or positioning of stabilising arrangements, the equipment should not be used unless these are in place and operating effectively.

You need to know:

- how to assess stability;
- what factors affect stability, including the additional factors when lifting a load from water;
- methods for improving stability;
- that where lifting equipment is connected to, or part of, another structure, then the structure must be capable of withstanding the forces and stresses the equipment imposes.

Key terms	
<i>Destabilising forces</i>	Forces which cause equipment to become unstable due, for example, to movement of the load, uneven or sloping ground, wind or a combination of these.
<i>Overturning</i>	When equipment turns over completely (ie through 180° or more).
<i>Stabilising arrangements</i>	Measures taken to ensure stability (eg outriggers, tie ropes, a solid base, ballast).

Mobile equipment and site erected equipment

The ACOP says:

112 You should ensure that lifting equipment which is mobile or which is dismantled and reassembled at different locations is used in such a way as to ensure its stability during its use under all foreseeable conditions. Particular account should be taken of the nature of the ground and other surfaces on which the equipment might be used.

You need to know:

- examples of mobile equipment (eg mobile cranes, fork-lift trucks, forwarders and cable cranes in forestry);
- examples of lifting equipment which can be dismantled and reassembled, (eg tower cranes, construction site hoists, mast climbing work platforms);
- how to ensure the stability of fixed equipment.

This part of regulation 4 links to regulation 8(1)(c), which is about ensuring that all lifting operations are carried out safely.

Key terms

Mobile

Lifting equipment which has wheels or tracks and is capable of being driven or otherwise moved (eg towed) to the location of the lift.

Dismantled and reassembled

Most frequently applies to the building, on site, of crane jibs.

Case study: Textile factory

A crane driver was seriously injured when he was crushed against a metal skip when his mobile crane overturned. The accident happened while he was loading items of scrap machinery from a textile factory, which was being demolished, onto a lorry. As he slewed the crane to lower the load onto the lorry, it overturned.

The primary cause of the accident was the state of the ground and the fact that the load, at the limit of the crane's capacity, started to spin as it was being slewed over the lorry. Heavy rain had made the ground soft under the crane's wheels. Under this combination of conditions the crane overturned. No assessment of the site conditions or plan for the job had been done.

Lifting equipment used on rails

The ACOP says:

- 117 Where lifting equipment is used on rails it should be fitted with suitable devices, for example to remove loose material from the rails, to minimise the risks of the equipment being derailed.**
- 118 The surface on which rail-mounted lifting equipment runs (with or without its load) should be sufficiently firm to support the rails. The rails should have an even running surface; be properly joined; laid so that the lifting equipment and its load can move freely and without danger of derailment.**

You need to know:

- how a firm surface for supporting rails will be achieved; and
- how rails should be laid.

Key terms	
Rails	A track for supporting and guiding wheels.
Derailed	When equipment comes off its rails.
Running surface	The upper surface of the rail which is in contact with the equipment's wheels.
Joins	The means of connecting individual sections of rails to make a continuous track.

Case study: Warehouse

An overhead crane in a warehouse gave rise to an emergency when its wheels became jammed. The crane was used to remove and replace containers of chemicals. During the incident the crane, which was in the process of lifting a container, jolted and stopped.

Immediate investigation of the cause revealed that the crane's wheels had come off the rails that ran the length of the warehouse. Corrosion of the rails had led to them cracking and eventually breaking on one side.

It was critical that the crane's load of chemicals was removed, since prolonged contact with air would have caused it to overheat and possibly self-ignite.

Equipment which runs on pneumatic tyres

If mobile lifting equipment is fitted with pneumatic tyres, it should not be used to lift loads unless the tyres are inflated to the correct pressure. You need to know how to measure tyre pressure.

Key terms	
Pneumatic tyres	Tyres which are inflated by compressed air.
Correct pressure	The correct pressure is given by the tyre manufacturer and depends on the duty and load which is carried.

Preventing overload

This deals with situations in which there is a strong risk of overturning or overloading. If there is a significant risk of overturning or overloading, the lifting equipment should be provided with devices such as rated capacity indicators and rated capacity limiters. These give audible or visual warnings when the safe lifting limits are being approached.

Regulation 4(b): the load being lifted

This part of the regulation is about ensuring that the parts of the load that become connected to the lifting equipment during lifting operations are sufficiently strong. Examples are lifting lugs welded in place to facilitate lifting, jacking or lifting points.

You need to know that:

- lifting points form part of the load;
- routine checks need to be made of the condition of lifting points;
- it may be appropriate to test the strength of lifting points such as welded lifting lugs.

Examples of lifting points include:

- lugs that are welded onto a steel beam before it is lifted, and that are removed afterwards;
- permanent fittings such as those on a skip which may often be lifted.

Key terms

Part of the load

Includes anything which connects the load to the lifting equipment and is lifted.

Case study: Distribution and warehousing

A storage container dropped while being offloaded from a lorry by a mobile crane. The container was of a type designed to stack. The lifting brackets in the top of the container had been damaged during a previous stacking operation; the lifting bracket had cracked and fractured during the lift.

The owner of the containers did not have in place an appropriate inspection system for ensuring that damage and any wear in the lifting brackets could be identified and remedied.

Activity

Under the regulation, the employer has a duty to assess lifting equipment stability in the circumstances of each lifting operation. Describe how this is handled in your situation. List who is responsible for:

- assessment;
- selecting and allocating lifting equipment for jobs.

Feedback on page 75.

Self-assessment questions

- 1 What two characteristics of lifting equipment are dealt with by regulation 4(a)?
- 2 What is the key consideration of regulation 4(b)?
- 3 What duty does regulation 4 place on employers?
- 4 Define the term 'load'.
- 5 What is the employer's duty in respect of the requirement for adequate strength?
- 6 As well as the weight to be lifted, what other considerations apply when assessing lifting equipment for a particular lifting operation?
- 7 In selecting lifting equipment for use, employers need to be aware of the standard modes of failure of critical components. What term is used to describe the extra provision for safety which must be available?
- 8 What must employers consider when assessing the stability of lifting equipment?
- 9 What is the criterion for adequate stability?
- 10 What duty is placed on employers where stabilising measures are required to ensure that equipment is stable?
- 11 What types of equipment are considered here?
- 12 What is the duty placed on the employer in these circumstances?
- 13 To what critical feature of these lifting operations must particular attention be paid?
- 14 What should be done to minimise the risk of derailment of lifting equipment?
- 15 What requirements apply to rails used for lifting equipment?
- 16 What is the critical requirement concerning tyres on lifting equipment?
- 17 What provision must be made where lifting equipment has tyres?
- 18 What is the main requirement in regulation 4(b)?
- 19 Are lifting points part of the lifting equipment or part of the load?

Answers on page 75.

Regulation 5

Lifting equipment for lifting persons

Key points

Regulation 5 is about making sure the many kinds of equipment used for lifting people are safe. Remember that lifting equipment can, and often does, carry people who may not be aware that any hazard exists. They can't be expected to be as vigilant for their safety as you would like. In these everyday circumstances, the equipment's design and operation have to be comprehensively safe.

Regulation 5 states:

(1) Every employer shall ensure that lifting equipment for lifting persons –

- (a) subject to sub-paragraph (b), is such as to prevent a person using it being crushed, trapped or struck or falling from the carrier;*
- (b) is such as to prevent so far as is reasonably practicable a person using it, while carrying out activities from the carrier, being crushed, trapped or struck or falling from the carrier;*
- (c) subject to paragraph (2), has suitable devices to prevent the risk of a carrier falling;*
- (d) is such that a person trapped in any carrier is not thereby exposed to danger and can be freed.*

(2) Every employer shall ensure that if the risk described in paragraph (1)(c) cannot be prevented for reasons inherent in the site and height differences –

- (a) the carrier has an enhanced safety coefficient suspension rope or chain; and*
- (b) the rope or chain is inspected by a competent person every working day.*

Regulation 5 applies to all lifting equipment used for lifting or lowering people, whether specifically designed or adapted for the purpose. The requirements of this regulation apply over and above the requirements of other LOLER regulations.

Examples of lifting machinery that may be used for lifting and carrying people (if the necessary precautions are taken) but which is not specifically designed for the purpose include:

- a fork-lift truck;
- a telescopic handler;
- a fixed or mobile crane.

Key terms	
Lifting equipment	In this regulation only, lifting equipment means all equipment for lifting people, with or without a carrier.
Carrier	The device used to support people while they are being lifted or powered. Also called the platform, car, cage, basket or chair.

Regulation 5(1): ensuring that the lifting equipment is safe

Regulation 5(1)(a) deals with carriers such as lift cars that are totally enclosed. Regulation 5(1)(b) deals with carriers that are not fully enclosed, such as mobile elevating work platforms (MEWPs).

Lifting people using equipment not designed for the purpose

The ACOP says:

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

You need to be aware of:

- the limitations of equipment which is adapted to lift people;
- measures to take to ensure safety in using the unspecialised equipment to lift people;
- the relationship of this regulation with regulation 7(d) relating to marking, and what is required when the equipment is not marked to confirm that it can be used to lift people safely.

Preventing people from falling or being crushed, trapped or struck

This emphasises the need to protect people who are entering, leaving, or inside the carrier (lift car).

The ACOP says:

Regulation 5(1)(a)

137 Regulation 5(1)(a) applies to carriers such as a lift car.

138 Any person in such a car should be suitably protected from being injured by something outside of it. To achieve this, the car should normally be fully enclosed when in use.

139 You should take appropriate precautions to prevent someone entering or leaving the car being struck by it. There should be a suitable enclosure around the car and, where necessary, appropriate protective devices to prevent access to the danger zone.

140 Any door or gate which is necessary in order to gain access or egress to/from the car should open so as to prevent any person falling accidentally from the car.

You need to know:

- how motorised, full-length doors should be fitted to the carrier;
- how the doors should operate if the lift stops between two levels;
- how the doors should be constructed and fitted.

Protecting people who are working from carriers which are not fully enclosed

This focuses on the need for an assessment of the risks that arise from other work equipment, structures or objects that a person falling from the carrier could strike.

If a person could fall more than 2 m, the carrier should be fitted with suitable edge protection. Gates and barriers should be designed so that when they are opened or closed, people are not exposed to the risk of falling. This means that they should:

- not open outwards;
- be fitted with a device to prevent them from opening inadvertently.

All floor surfaces on platforms and enclosures must be non-slip.

The ACOP says:

Regulation 5(1)(b)

143 Regulation 5(1)(b) deals with persons working from carriers which are not fully enclosed.

144 Where a person in such a carrier might fall 2 m or more, the carrier should be fitted with suitable edge protection. This should also be provided where a person might fall less than 2 m where there are factors that would increase the likelihood of a fall or the risk of serious injury.

145 Any edge protection on the carrier should be suitable for the purposes for which it is to be used and it should be securely fixed to the carrier.

146 The floor area of any carrier on which persons need to be present should be slip-resistant.

Case study: Sports ground

During a routine check on the overhead lighting of a football stadium, an electrician working on his own was using a vertical elevating platform. When he reached a particular spot, he was not able to place the platform in the ideal position – directly below the lighting. With the platform at its elevated height, he stood on the middle guard-rail that surrounded the platform and stretched across to reach a defective light fitting. He lost his balance and fell 4 m onto hard ground, sustaining serious head injuries and breaking a leg. Although a safety harness had been available for use with the platform, there were no instructions or information on how to use it.

As a result of the accident, the stadium owners replaced the platform with a lift that gives mobility horizontally as well as vertically and have included use of harnesses in a safety training programme.

Case study: Lift surfing

An 11-year-old boy was fatally injured when he was trapped between the top of a lift car and the ledge on the inside of the lift wall. The boy was one of a group of children who, after gaining unauthorised access to the shaft and then to the top of the lift car, had operated the car-top control to ride up and down the shaft on top of the lift car. (This is known as 'lift surfing'.)

Reducing the risk of the carrier falling

This deals with regulation 5(1)(c). Here the regulation aims to ensure that devices are provided to prevent the carrier from free-falling. The devices need to be independent of the carrier's primary means of suspension. They include:

- multiple ropes (with independent anchorages);
- multiple cylinders;
- ropes, chains or hydraulic pipes with a high factor of safety;
- safety gear;
- check valves (for hydraulically powered systems).

You may also need further measures to ensure safety, for instance:

- derating the equipment;
- daily inspections by a competent person;
- providing effective training for everyone involved in the lifting operation.

It is also important that the lifting equipment is positioned so that, should the primary means of lifting fail, the effects are minimised.

Ensuring that people can be freed if trapped

This final sub-paragraph of regulation 5(1) is about situations in which passengers become trapped in the carrier. They must not be exposed to danger, including any other hazards such as:

- overheating;
- oxygen shortage;
- fumes;
- smoke.

Anyone trapped must be able to raise the alarm and make their predicament known so they can be freed.

You need to know:

- the various ways in which the alarm can be raised (eg by telephone or radio link, alarm bell, klaxon);
- appropriate lowering systems;
- precautions that could be taken, for example installing self-help equipment.

Case study: Warehouse

Four operatives from a pharmaceutical warehouse were at the end of their shift and using the personnel lift to descend to ground level. Someone had forgotten to close the landing gates properly and caused the lift to stop between floors. Due to a spillage of dangerous chemicals in the warehouse that overloaded the drains, chemicals had seeped into the lift well and collected in a sump at the bottom of the well.

The trapped operatives raised the alarm from inside the lift and an emergency crew was quickly on the scene. They cleared the fault at the landing gates, lowered the lift and rescued the operatives. At this point it

became clear that all four had breathing difficulties and were suffering from the effects of fume inhalation. All of them needed urgent hospital treatment.

As a result of this incident, all personnel lifts in the warehouse were fitted with fresh air breathing apparatus.

Regulation 5(2)

This refers to mine winding gear. Compliance with the Mines (Shafts and Winding) Regulations 1993 satisfies the requirements of regulation 5(2). Equipment used for the lifting of people should have a safety coefficient relating to its strength of at least twice that required for general lifting operations.

Key terms

Safety coefficient

Applied to safety ropes and chains, it means the factor of safety in the specification which gives the additional strength needed to guarantee their performance.

Activity

- 1 If possible, arrange to take a ride in two different items of lifting equipment designed to lift people. Assess the equipment in relation to regulation 5: the potential for people to be crushed, trapped or struck in the carrier or to fall from it; whether there are suitable arrangements to prevent carriers from falling; the existence of safety devices if falling cannot be prevented; the risk of someone falling out of the carrier; whether anyone who may become trapped in the carrier is exposed to danger; whether they can be freed.
- 2 From the safety records you keep in your organisation, find out:
 - the number of incidents that have been concerned with equipment for lifting people;
 - the specific types of equipment that were involved.

Feedback on page 76.

Self-assessment questions

- 1 What equipment does regulation 5 focus on?
- 2 What are the four provisions of part 1?
- 3 List the groups of people regulation 5 seeks to protect.
- 4 What conditions apply when lifting people using equipment which is not designed for the purpose?
- 5 What should normally be provided to protect people in a lift car from injury?
- 6 What must carriers for lifting people be prevented from doing?
- 7 What three requirements for the safety of carriers are specified in the LOLER ACOP?

Answers on page 76.

Regulation 6

Positioning and installation

Key points

This regulation is about making sure lifting equipment is not positioned or installed in a way, or a situation which would create safety risks. It applies equally to equipment which is:

- permanently installed;
- mobile.

Therefore, the measures taken to control risks will vary.

The regulation is in two parts:

- part 6(1) deals with the main risks;
- part 6(2) is concerned with the particular problem of open hoistways and shafts.

The main areas of risk in part 6(1) are:

- being struck by equipment or a load being lifted;
- the result of a load drifting during lifting;
- a load falling freely or being released unintentionally.

Regulation 6 states:

(1) Every employer shall ensure that lifting equipment is positioned or installed in such a way as to reduce to as low as is reasonably practicable the risk –

- (a) of the equipment or a load striking a person; or
- (b) from a load –
 - (i) drifting;
 - (ii) falling freely; or
 - (iii) being released unintentionally;
 and it is otherwise safe.

(2) Every employer shall ensure that there are suitable devices to prevent a person from falling down a shaft or hoistway.

Key terms

Load drifting	Uncontrolled movement of a load, for example spinning, swinging, over-running.
Load falling freely	Where a load falls unrestrained. This includes circumstances in which a load is still attached to lifting equipment.
Load released unintentionally	Where a load becomes unintentionally disconnected from its lifting equipment.
Shaft or hoistway	The well-like passage or tunnel for the transit of hoists.

Regulation 6(1)(a): being struck by lifting equipment or its load

The ACOP deals with minimising the risk of being struck by lifting equipment, or its load, in five typical situations:

- avoiding lifting over people;
- providing adequate space to avoid crushing;
- providing substantial hoist enclosures; OR
- when the height of travel is less than 2 m, providing effective underside protection;
- avoiding or preventing access to trapping points.

The ACOP says:

Regulation 6(1)(a)

162 Lifting equipment should be positioned or installed to minimise the need to lift loads over people.

163 In particular, lifting equipment should be positioned and installed to prevent crushing when it is in its extreme positions.

164 A load moving along a fixed path, such as a conventional lift or hoist, should be efficiently protected by a suitable and substantial enclosure, or some other equally effective measure, to minimise the risk of a person being struck by the equipment or the load.

165 In the case of lifting equipment which follows a fixed path, but whose maximum height of travel above ground or floor level is no more than 2 m, you should provide an enclosure where practicable. Where this is not practicable, you should provide a barrier or gate or other equally effective means, to prevent any person being endangered by the underside of the lifting equipment or by any fitting attached to it.

166 You should position or install lifting equipment with a travelling or slewing motion to prevent trapping points. Where this is not possible you should take effective measures to prevent access of persons to such trapping points.

LOLER regulation 8 requires measures to be taken when planning to minimise risks of the above. The measures taken need to be appropriate to the type and application of the equipment and passageways or other access pathways need to be of sufficient width AND may need to be covered.

Key terms

Extreme position

Where equipment is at the end of its normal travel or movement, in any direction.

Enclosure

A structure, either within and part of a building, or free standing, which surrounds lifting equipment along the path of its travel.

Trapping points

Accessible areas between moving and stationary parts of equipment or between moving parts or equipment and surrounding enclosures.

Case study: Building site

A platform hoist on a building site was not properly enclosed and resulted in a serious injury to a site visitor. The hoist was being operated by a roofing subcontractor to raise the roofing tiles 8 m to an upper floor landing. The hoist operator was inexperienced and the hoist platform suddenly fell freely, striking the person who had walked into the hoistway.

Although the hoist had been provided with front gates, neither the sides nor rear were enclosed. Later testing found that the hoist was in good working order.

Case study: Fishing

A fisherman was injured when he was trapped while unloading fish from the hold of his fishing vessel using a mechanical elevator.

He was shovelling fish when his foot became caught between the down-running paddle and the fixed structure of the elevator; he was drawn into the machine. A safety switch was operated by a second fisherman but it had been bypassed and did not operate.

The accident could have been prevented by provision of a guard to protect anyone moving into the trapping area.

Regulation 6(1)(b): loads drifting, falling and being released unintentionally

The aim of this part of the regulation is to ensure that loads are always under control and that there is never a risk of uncontrolled freefall.

The positioning and installation of lifting equipment have a lot of bearing on the safety of lifting operations and on the risks created by loads which are insecure, or whose movements are uncontrolled. The ACOP specifies what is required to ensure safety where:

- loads are likely to drift;
- loads must be prevented from falling freely;
- power failure could give rise to loads being released;
- loads could separate from lifting hooks and other devices.

Various devices may be used to minimise the risks, such as multiple ropes and safety gear.

Note: gravity discharge of loads, for example piling or grain filling, is not included in this part of the regulation.

The ACOP says:

Regulation 6(1)(b)(i)

170 Appropriate measures should be taken to prevent a freely suspended load from moving in an uncontrolled manner where the risks justify it.

171 Runway beams supporting lifting equipment should be level and of sufficient stiffness to prevent equipment drifting or running away.

Regulation 6(1)(b)(ii)

172 Where appropriate, lifting equipment should be fitted with suitable devices to minimise any risk from the load falling freely.

Regulation 6(1)(b)(iii)

175 You should ensure that where, in the event of a power failure, the lifting equipment will not be able to maintain its hold on the load, appropriate measures are in place to prevent persons being exposed to any consequential risks.

177 Hooks and other similar devices provided for lifting should be of a type that reduces the risk of the load becoming displaced from the hook or other devices.

You should know:

- the different types of power systems: mainly pneumatic, hydraulic, vacuum or magnetic;
- why back-up systems are essential;
- why warnings are required;
- relevant safe systems of work for danger zones;
- recommended ways of making hooks, safety catches and plate-clamps secure.

Key terms	
<i>Tag lines</i>	Ropes or chains attached to loads for the purpose of keeping them steady during lifting.
<i>Sufficient stiffness</i>	Beams which will not deflect unduly under load and introduce sloping support surfaces.
<i>Power failure</i>	Failure of the equipment's power source.
<i>Consequential risks</i>	Risks which could follow as a result of equipment being unable to maintain its hold on a load.
<i>Load displacement</i>	Separation of a load from its lifting equipment as a result of relative movement between them.

Additional requirement: 'otherwise safe'

Further to the particular risks associated with lifting equipment already described, there is an additional requirement in regulation 6(1): equipment has to be 'otherwise safe'. The risks associated with collision between equipment and their loads during lifting operations is featured in the ACOP.

You need to be aware of:

- ways of avoiding overlap between operating paths, for example of tower cranes;
- suitable motion-limiting devices;
- the need for load boundary marking and how to implement it;
- appropriate safe systems of work.

The ACOP says:

179 Where two or more items of lifting machinery are used they should be installed or positioned so as to prevent the loads and/or parts of the equipment coming into contact with one another.

Regulation 6(2): enclosing hoistways

This regulation deals with proper enclosures of shafts and hoistways. It aims to protect people from coming into contact with lifting equipment and prevent them from falling into shafts and hoistways.

You need to know:

- how to identify critical locations by risk assessment;
- ways to implement appropriate protection by gates, fences and cages;
- the importance and purpose of interlocking gates;
- the different types of gate and their application;
- other ancillary protective devices which may be required.

The ACOP says:

183 Suitable and substantial gates, or other equally effective means, should be provided at any access and/or egress points to any hoistway or shaft enclosure.

184 Any such gate, or other equally effective means, should be fitted with efficient interlocking or other devices, such that (a) the gate cannot be opened except when the lifting equipment is at the landing and (b) the lifting equipment cannot be moved away from the landing until the gate is closed. If it is not reasonably practicable to fit such devices, you should provide alternative arrangements to ensure that the gate is kept closed and fastened except when the lifting equipment is at rest at the landing. Any gate needs to be of suitable height to prevent people toppling over or reaching over it and be of adequate strength.

Key terms

Gates

The normal means of closure at points of entry or exit to a hoist.

Landings

The places at different levels where people enter and leave hoists.

Interlock

A safety device which connects the operation of the hoist and the hoist gates.

Case study: Residential care home

The ward services in a care home's recently built multi-storey extension were seriously disrupted following immediate closure of the patient lifts. A porter had raised the alarm when she found that the lift doors on the fourth floor landing could be opened into the shaft while the lift was travelling between floors.

Inspectors found that the door interlocking beak on three of the five landings failed to engage the interlocking system. The lift contractor responsible for the installation claimed that due to various pressures he was under, commissioning checks had not been carried out prior to handing over the lifts for use. He was required to replace all door mechanisms and complete all the checks to verify the correct working of the interlocking systems before the lifts could resume operation.

Activity

Find out, in your situation, how many incidents in the past two years have resulted from risks covered in regulation 6.

Feedback on page 77.

Self-assessment questions

- 1 What in general is the duty placed on employers by regulation 6?
- 2 What four specific risks are associated with loads during lifting operations with which the regulation is concerned?
- 3 Further to its particular requirements, what is the additional requirement in regulation 6(1)?
- 4 What danger exists where there are hoistways or shafts?
- 5 What are the three particular situations where people would be at risk of being struck due to the positioning of lifting equipment?
- 6 What must be provided to ensure compliance with regulation 6(1)(a) when lifts, hoists and similar equipment are installed?
- 7 What particular risks are involved where this type of equipment travels no more than 2 m?
- 8 What are the two common problems the ACOP deals with in relation to 'drift'?
- 9 What must employers provide to ensure that loads are prevented from falling freely while being lifted?
- 10 What risk is addressed in regulation 6(1)(b) in the event of a power failure?
- 11 What must be done to avoid devices that hold or grip loads during lifting (eg hooks or plate clamps) from relaxing their hold?
- 12 What does regulation 6(2) aim to control?
- 13 In both cases, what must employers provide?
- 14 Complete the statements:
 - (i) _____ cannot be opened except when the lifting equipment is at _____.
 - (ii) The lifting equipment cannot be moved away from _____ until the gate is _____.

Answers on page 77.

Regulation 7

Marking of lifting equipment

Key points

Regulation 7 is about making sure that lifting equipment and accessories, often called lifting tackle, are marked clearly with information about their lifting capability. The markings which are needed to ensure the safe selection and use of the equipment are:

- the safe working load (SWL);
- information about any special characteristics of the accessories;
- statements for equipment which has been designed for lifting people – or which is not designed for lifting people, but may be used in error.

LOLER regulation 7 builds on regulation 23 of PUWER, which deals with the marking of work equipment. The regulation is in five parts.

Regulation 7 states:

Every employer shall ensure that –

- (a) subject to sub-paragraph (b), machinery and accessories for lifting loads are clearly marked to indicate their safe working loads;*
- (b) where the safe working load of machinery for lifting loads depends on its configuration –*
 - (i) the machinery is clearly marked to indicate its safe working load for each configuration; or*
 - (ii) information which clearly indicates its safe working load for each configuration is kept with the machinery;*
- (c) accessories for lifting are also marked in such a way that it is possible to identify the characteristics necessary for their safe use;*
- (d) lifting equipment which is designed for lifting persons is appropriately and clearly marked to this effect; and*
- (e) lifting equipment which is not designed for lifting persons but which might be so used in error is appropriately and clearly marked to the effect that it is not designed for lifting persons.*

Key terms

Safe working load (SWL)	The maximum load that the equipment may safely lift.
Equipment configuration	An arrangement of equipment components, changeable by design, to suit different lifting requirements.
Accessories for lifting	A variety of appliances designed for lifting operations including slings, chains etc.
Characteristics of accessories	Information which is particular to certain accessory items for reasons of safety.

Regulation 7(a) and (b): safe working load (SWL)

Marking the safe working load (SWL) has different requirements according to the type of equipment. Where equipment has one fixed SWL, for example an overhead crane, regulation 7(a) requires this to be clearly marked.

Please note that:

- other terms may sometimes be used to mean SWL, for example 'rated-capacity' and 'working load limit';
- various types of marking can be used; you should know what type(s) to use in your situation;
- there are associated requirements in LOLER regulation 8(c), which you should read in conjunction with this regulation.

Where the SWL of lifting equipment can vary to suit different lifting operations, the ACOP for 7(b) sets down requirements.

You need to know:

- the types of lifting equipment for which the SWL can change;
- what to do when the operating radius changes the SWL;
- when to allow a factor of safety (equipment derating);
- the range of automatic devices which limit equipment to operate within its SWL;
- the need for information to explain how configuration affects the SWL.

The ACOP says:

Regulation 7(b)

189 You should ensure that where lifting machinery has a safe working load which varies with its operating radius or is dependent upon how it is configured, it is either clearly marked or adequate information is provided to indicate to the user the corresponding safe working load. Any marking should be clearly visible or the information be readily available to the operator or user.

190 Where there is a significant hazard arising from the use of the machinery it should be provided with appropriate equipment or devices such as rated capacity indicators and rated capacity limiters.

197 Any structural element of any lifting equipment which is occasionally dismantled or partially dismantled, and which is, or may become, separated from the lifting equipment, should be marked to indicate the equipment of which it is a part.

Key terms

Operating radius

The distance horizontally between the lifting equipment and the point of suspension of its load.

Rated capacity indicator

An automatic device which displays to the equipment operator the safe working load which can be lifted (previously known as safe load indicator or moment load indicator).

Rated capacity limiter

A device which automatically stops and prevents equipment from lifting loads which are beyond its rated capacity.

Case study: Restaurant

When a restaurant changed hands and was being refurbished, the local authority enforcement officer called to examine the new premises. She asked the owner how wine, spirits and beer would be lifted to the new bar in the restaurant's dining area on the first floor. The owner said that he would use the existing dumb waiter from the store/kitchen level on the ground floor which he claimed had room enough to take wine cases and beer casks. There was no readily visible marking of the lifting capacity of the dumb waiter and the owner was not aware of it. The inspector examined the pulley system in the equipment's lifting void and identified a weight stamped on the pulley wheel of 0.5 cwt (about 25 kg). This was clearly inadequate and the restaurant was prohibited from using it. The owner was required to carry out an engineer's survey of the lifting requirements and to implement its recommendations for appropriate equipment and safe operation.

Case study: Construction site

A major construction company was heavily fined after an overloaded crane toppled over and dumped a 3.5-tonne bridge section within a few metres of a busy main road. Because of the crane's position and its operating radius, no more than 2.65 tonnes should have been lifted.

Although the crane was fitted with an automatic load indicator which displayed its safe working load, the crane driver had not been told and was not aware of the weight of the load being lifted. He thought the automatic load indicator was for guidance only; the charts in the crane for calculating how much could be lifted had been defaced and were more or less unreadable.

Regulation 7(c): marking lifting accessories

This part of the regulation considers how accessories should be marked to indicate their individual lifting capacities OR limitations. There is a great range of lifting accessories to take into account and you should be aware of those most commonly used. The ACOP focuses on marking accessories which:

- are used in assemblies;
- have significant weight;
- are used for particular applications.

The ACOP says:

199 Where a number of lifting accessories are assembled to form one lifting assembly which is not dismantled after use, the assembly should be marked to indicate its safety characteristics to users.

200 Where the weight of an accessory is significant in relation to the safe working load of the machine with which it is intended to be used, the accessory should be clearly marked with its weight.

201 Where there are other characteristics which might make the use of an accessory for lifting unsuitable in a particular application then this information should be marked or otherwise be available to the user.

Any individual elements of lifting equipment which could become separated following dismantling should be marked – the marking should enable the elements to be correctly matched to their equipment.

Key terms

Accessory

May be a single item (eg shackle) or an assembly of items (eg lifting beam and slings).

Safety characteristics

Special safety information such as the weight of the accessory, whether the accessory should only be used with a specific part of the lifting equipment, or where its use could be affected by heat, corrosive atmosphere etc.

Lifting assembly

A lifting device constructed for a specific purpose by using accessories as its component parts.

Case study: Fabricated steel stockist

A steel plate fabrication suspended from an overhead travelling crane fell, crushing a worker in the warehouse. The fabrication was a complex shape and was being lifted by a combination of lifting accessories. An endless chain sling had been passed through openings in the fabrication and three 15-tonne single-leg chains were attached to it. The three single-leg chains were attached to the overhead crane's hook.

The load, which had been supported on bearers of various heights, was lifted only a few millimetres when the endless chain snapped, causing the fabrication to topple.

The safe working load of the endless chain was 2 tonnes and the fabrication weighed 10 tonnes. No information could be found about the lifting capacity of the endless chain. Its SWL was established by testing during the investigation.

Regulation 7(d): lifting persons

This deals with marking lifting equipment to indicate that it has been designed for lifting people, and specifically the requirement to display the maximum number that may be carried.

Note that:

- the information is to be *clearly* displayed in the carrier;
- the SWL must also be displayed.

Key terms

Carrier

The cage, car or other device which contains the passengers.

Regulation 7(e): lifting persons in equipment not designed for the purpose

The main point about this part of the regulation is that lifting equipment which is not designed for lifting people should be clearly marked to say that it should *not* be used for lifting people if there is any chance that it might be used in error.

Activity

List two items of common lifting equipment and accessories used at your site – if possible one for lifting people, and one general item of lifting equipment. Then:

- write down how both items are marked – what does the information say about the equipment's lifting capability and SWL?
- describe the equipment, and the markings, on equipment designed to lift people;
- explain any changes needed in the markings in order to comply with the regulation and draw up a plan of action for making the changes.

Feedback on page 77.

Self-assessment questions

- 1 What terms are used in regulation 7 (and the associated PUWER regulation 23) to explain how equipment must be marked to ensure its safe use?
- 2 Explain one of the two things employers must do about marking information when equipment can be configured – or arranged – in a number of ways.
- 3 Regulation 7 says that it must be clearly shown when lifting equipment has been designed for lifting a particularly valuable load. What is the load?
- 4 What marking provisions must be made for lifting accessories so that they are used safely?
- 5 What term is used in regulation 7(a) and (b) for the clear marking and indication of the lifting capacity of the equipment?
- 6 State the three kinds of lifting equipment whose lifting capacity varies according to use and so come within the scope of regulation 7(b).
- 7 Explain three ways information about lifting capacity should be provided to users.
- 8 What marking must be provided when a permanent assembly of lifting accessories is used?
- 9 When must the weight of an accessory be taken into account and be clearly marked in lifting operations?
- 10 Because of its characteristics, an accessory may be unsuitable for particular applications. How should this be conveyed to users?
- 11 What information must be clearly displayed in equipment that is designed to carry people?
- 12 What is the purpose of the additional marking required in equipment that is occasionally dismantled?

Answers on page 78.

Regulation 8

Organisation of lifting operations

Key points

This regulation is about making sure that the actual lifting operation is safe. It deals with what must be done before, during and after lifting to make sure that the operation is carried out without endangering anyone. It is in two parts:

- part 1 contains the main provisions;
- part 2 is a statement about what 'lifting operations' means.

The main requirements of part 1 are that lifting operations must be:

- planned;
- supervised; and
- safe.

Regulation 8 states:

(1) Every employer shall ensure that every lifting operation involving lifting equipment is –

- (a) properly planned by a competent person;*
- (b) appropriately supervised; and*
- (c) carried out in a safe manner.*

(2) In this regulation "lifting operation" means an operation concerned with the lifting or lowering of a load.

Regulation 8(1)(a): planning lifting operations

This is the heart of the regulation. It links to the requirement to provide suitable work equipment, which is required by PUWER regulation 4.

Those planning need to know:

- the typical elements in a simple lifting plan;
- that the lifting equipment selected must be suitable for the lifting proposed;
- the capability of the equipment; if it is not known, information about the capability must be sought from the manufacturer.

The elements of a plan, as identified in the guidance, are that:

- equipment to be used must be within its safe working load (SWL);
- the plan must be based on risk assessment, as is also required by regulation 3 of the Management of Health and Safety at Work Regulations 1999;
- it must be drawn up by a competent person – for example, planning of individual routine lifting operations may be the responsibility of those who carry them out (eg a slinger or operator); the planner must be a competent person by virtue of their knowledge AND expertise in particular lifting operations;
- the plan should be written down for complex operations.

Note that the planning principles in BS 7121⁽²⁾ (dealing with the safe use of cranes) can be applied to other types of lifting equipment.

Plans may need to be in two parts:

- initial planning – selecting the work equipment, personnel etc;
- planning the specific lifting operation.

For routine lifting operations an initial plan may only be required once, for example for fork-lift trucks in a warehouse. However, it may be necessary to review the plan to make sure that nothing has changed and the plan remains valid. Complex routine lifting operations may, depending on the circumstances, need to be planned each time the lifting operation is carried out.

The ACOP says:

Regulation 8(1)(a)

210 The person planning the operation should have adequate practical and theoretical knowledge and experience of planning lifting operations.

211 The plan will need to address the risks identified by the risk assessment and identify the resources required, the procedures and the responsibilities so that any lifting operation is carried out safely.

212 The plan should ensure that the lifting equipment remains safe for the range of lifting operations for which the equipment might be used.

213 Where two or more items of lifting equipment are used simultaneously to lift a load, where appropriate a written plan should be drawn up and applied to ensure safety.

Key terms

The plan

The proposed arrangements based on considering all relevant factors, in two parts: one dealing with initial planning, the other with individual lifting operations.

Competent person

Person nominated to provide the lifting plan by virtue of relevant knowledge and expertise.

Written plan

A plan for complex lifting operations, written to assist communication and understanding between the parties involved.

Resources

People, materials, equipment, accessories.

Case study: Dockside

A stevedore helping to unload a merchant ship in a dock died when he was crushed against the side of the ship by an 11-tonne coil of steel strip.

For offloading the heavier items of its cargo such as coils of strip steel, a ship was moved to a berth adjacent to a mobile crane, which was weighted to lift heavier loads than the normal dockside cranes.

The accident happened when an attempt was made to unload one of the larger coils from the side of the ship that was away from the dock. Usually

a wire mat sling would have been passed through the hollow centre of the coil to do this, but the coil was against other cargo so this was not possible. A coil boom was therefore put through the coil centre from one side, but it only reached part way.

While the coil was being dragged across the hold so it could be lifted out, the coil boom slipped out. The coil rolled to the opposite side of the ship and crushed the stevedore.

In addition to the unsafe method of using the coil boom, the investigation found that the crane had been used beyond its SWL. While the weight of the coil would have been within the SWL at the crane's minimum radius, the crane was grossly overloaded at the radius at which it was being used.

Crucially, however, there had been no written plan of work for this complex lifting operation.

Regulation 8(1)(b): appropriate supervision

The duty on employers to provide supervision under the Health and Safety at Work etc Act 1974 (HSW Act) 2(2)(c) is extended by LOLER regulation 3(5) to other duty holders. Providing the right supervision ensures compliance with both the HSW Act and LOLER.

The key term in this part of the regulation which you need to understand is 'appropriate supervision'.

Key terms	
<i>Appropriate supervision</i>	Supervision which is proportionate to the risk and takes account of the personnel involved in the particular lifting operation, such as those with disabilities and the inexperienced.

Regulation 8(1)(c): carrying out lifting operations safely

The ACOP details 12 factors to be considered when carrying out a lifting operation safely:

- working under suspended loads;
- visibility;
- attaching/detaching and securing loads;
- environment;
- location;
- overturning;
- proximity hazards;
- derating;
- lifting persons;
- overload;
- pre-use checking;
- continuing integrity of the equipment.

Working under suspended loads

This is about controlling the risks when loads are suspended. Suspending a load creates a danger zone for those below.

You need to know:

- how to avoid lifting over unprotected areas and what to do when circumstances dictate that people need to work under suspended loads;
- how to deal with situations where loads are left suspended;
- the reasons for preventing access to danger zones and how to apply safe systems of work to exclude people from danger zones;
- what other, secondary safety measures can be taken (eg safety nets) where the risks cannot be controlled.

The ACOP says:

Regulation 8(1)(c) – working under suspended loads

230 Where practicable, loads should not be carried or suspended over areas occupied by persons.

231 Where this is not practicable you should establish a safe system of work which minimises the risks to persons who may need to be below the load.

232 Where it is necessary to leave loads suspended you should ensure that access to the danger zone is prevented, ensuring that the load has been secured properly.

Key terms

Left suspended

The situation in which a load hangs from, or is supported by, lifting equipment which is stationary.

Danger zone

The area beneath the load to which access is forbidden and which is unsafe during a lifting operation.

Case study: Vehicle exhaust fitting centre

A mechanic and his supervisor were seriously injured when they were crushed by a vehicle hoist which crashed to the ground. The vehicle was positioned on a centre post vehicle hoist in the elevated position. The two employees were working under the car when the hoist crashed and trapped them.

The accident was due to lack of maintenance and poor workshop practice in leaving the hoist in an elevated position for 48 hours over the weekend.

The hoist was short of hydraulic oil and had air in the system. Because of the air, the ram would rise slowly at first, then after a pause when the air pressure increased, it would rise quickly to its maximum height. The ram tended to jam in this position.

The hoist, with the car in this position, was left for the 48 hours with the control in 'hold'. Normally loss of air would have caused the hoist to descend, but because of the poor maintenance and the sticking of the ram, the car remained elevated on the table without support. As soon as the employees started work on the car's exhaust system, the table became dislodged and crashed to the ground.

Visibility

This part of the regulation is about making sure that a form of communication is used to guide operators of lifting equipment when they cannot see either directly or indirectly the path travelled by their load. The emphasis here is that the communication must be appropriate, and that measures must be taken to prevent the load striking anyone or anything.

You need to know:

- different types of auxiliary devices which can be used for indicating the position of the load to the operator of the lifting equipment;
- alternative systems of work which would reduce the hazards by providing the operator with information on the position of the load;
- the role which assistants can play in communication;
- a recommended code of hand signals;
- the minimum requirements for verbal communication.

The ACOP says:

Visibility

237 If the operator of lifting equipment cannot observe the full path of the load, either directly or by means of auxiliary devices, the employer should ensure that a responsible person has appropriate means of communication to guide the operator. Measures should be taken to prevent the load striking anything or any person.

Key terms

<i>Full path of the load</i>	The route to be travelled between the start and finish of the lifting operation.
<i>Auxiliary devices</i>	Equipment or objects used to provide information about the path of the load.
<i>Responsible person</i>	Someone appointed who can reliably communicate information about the position of the load.

Case study: Manufacturing

A production operative was crushed by a 3-tonne strip coil of aluminium which was being lowered into position in a coil storage area. The coil was being moved by a pendant controlled crane. The space in the storage area into which it was to be placed was not completely visible to the controller, who could not see the operative approaching the space. At the last moment the controller was alerted by others in the vicinity and he operated the crane's emergency stop. He could not prevent the suspended coil from swinging into the path of the operative and crushing him against the standing coils in the area.

Attaching, detaching and securing loads

The ACOP for this deals with:

- the need for load-securing accessories to be compatible;
- the measures to be taken to prevent loads disintegrating;
- the need to shorten slings and chains safely;
- the requirement that only authorised persons may attach and detach loads.

You need to know:

- the importance and meaning of the term 'load handler', the competence which load handlers require, and the duties of load handlers within a system of work;
- how to put measures in place which ensure that a load stays intact, for example by plastic sheeting of palletised loads;
- how to use packing material, where appropriate, to prevent damage to lifting accessories.

The ACOP says:

Attaching/detaching and securing loads

244You should ensure that any lifting accessories used for securing the load are compatible with the load, taking into account any attachment points on the load, the environmental conditions in which the accessories will be used and their configuration of use.

245You should ensure that appropriate measures are taken to prevent the load, or part of the load disintegrating while being lifted.

246Ropes, chains or slings should only be shortened in a safe manner.

247You should ensure that the lifting operation is organised so that the lifting equipment is not operated unless the person attaching or detaching the load has given their authorisation to do so or it has been given by some other authorised person.

Key terms	
Securing the load	By proper use of lifting accessories and other necessary materials, loads need to be held stable and intact.
Load handler	The person with responsibility for attaching/detaching and securing the loads to the lifting equipment.
Disintegration of the load	The breaking up or destabilising of a load during lifting.
Authorised person	The person responsible for ensuring that the load has been: <ul style="list-style-type: none">■ secured and properly attached to the lifting equipment and is therefore safe to lift;■ properly detached at the end of the operation.

Case study: Distribution and transport

A driver who was delivering 11-metre steel beams to an engineering construction company was fatally crushed when an 'I' section beam was dislodged from a stack on a lorry. The stack had been secured by steel bars bent round the flanges of the top and bottom beams. These securing clips should have been removed before unloading began. Instead, the driver decided to unload the beams individually using a crane with a higher SWL that was available at the yard. A double chain sling was hooked under the web of the top beam on the stack of seven.

During the operation, the securing bars sprang open. The top beam toppled, knocking the driver off the lorry's trailer. The beam, weighing three-quarters of a tonne, landed across his back and caused the fatal injuries.

Environment and location

This deals mainly with controlling risks of lifting operations that are carried out in the open air. When out of doors, lifting equipment and those involved in using it may be exposed to severe, unpredictable weather and other difficult conditions. Two aspects of special concern in 8(1)(c) are:

- when to halt the lifting operation;
- use of lifting equipment when there is limited headroom.

You need to implement safe systems of work and provide measures in the event of:

- severe weather conditions (eg fog, lightning, heavy rain);
- unsafe conditions following severe weather (eg waterlogged or unsuitable ground).

You must make sure there is adequate site access/egress for, and suitable space to position and install the lifting equipment (eg outriggers).

It may be necessary to carry out a 'thorough examination' of the lifting equipment following the effects of severe weather.

The ACOP says:

Environment

253The use of lifting equipment in the open air should be halted where meteorological conditions deteriorate to the point that it could affect the integrity of the lifting equipment or expose persons to danger. You should also ensure that appropriate measures are in place to minimise the risks to exposed persons.

Location

256Lifting equipment should only be used where there is sufficient headroom.

Key terms

Integrity of lifting equipment

Physical soundness and suitability for the task or purpose.

Sufficient headroom

Space for equipment to operate within the limits of its travel or movement.

Case study: Petrochemical industry

An oil rig operator was crushed when an equipment module weighing 120 tonnes swung under the force of a gale in the North Sea. The module, a large steel-clad structure, was being lifted from the supply barge by a pedestal crane on the rig. A number of oil rig technicians had been detailed to help locate the module on its support pads on the upper deck of the rig.

There had been weather warnings that conditions were rapidly getting worse. The possibility that tag lines would be needed had been discussed, but was not acted upon. As the crane brought the module above its landing points, the wind made it sway. On lowering, it drifted away from its support pads, crushing one of the rig technicians.

The lifting operation was abandoned and the module was parked on an open area of the deck pending investigation.

Overturning

Instability, tilting and overturning are everyday concerns of those who carry out lifting operations. This part of 8(1)(c) deals with controlling such risks by:

- preventing use where equipment would be subject to overturning movements;
- having measures in place to prevent tilting and overturning; AND by
- not using lifting equipment to drag loads.

Operators need to know:

- the limits of the lifting equipment's capabilities - the equipment must not be subjected to excessive stress;
- the weights to be lifted, or reliable ways of estimating the weights where they are uncertain;
- the importance of not dragging loads and the reasons for avoiding this;
- the risks associated with equipment travelling with its load raised.

The ACOP says:

Overturning

258 Lifting equipment should not be used in a manner likely to cause it to overturn.

259 You should ensure that appropriate measures are in place to prevent lifting equipment from tilting, overturning and, where appropriate, moving or slipping. The employer should ensure that suitable checks are made to achieve this.

260 Lifting equipment should not be used to drag loads if such operations are liable to cause damage or overload the lifting equipment.

Key terms

Overturning

When equipment turns over completely (ie through 180° or more).

Dragging loads

Trailing a load along the ground.

Case study: Crane operator

The driver of a crane was struck by the jib when the crane was pulled over. After loading scrap metal tanks on to a contractor's lorry, the lorry moved forwards and pulled over the mobile crane used in the loading operation. A four-legged sling had been left hanging from the crane hook and one of the sling hooks had snagged on the load as the lorry moved away.

Proximity hazards

The ACOP addresses the risks arising from lifting equipment operating close to other structures or load formations that represent a hazard.

You need to know:

- that measures to deal with the proximity hazard should be appropriate to the equipment and the hazard (hazards may be fixed equipment, mobile equipment or both);
- what the main proximity hazards are in your situation – examples include overhead power lines, other work equipment or structures, trenches and excavations, low bridges, underground services;
- ways to devise measures to prevent equipment from falling into excavations where mobile equipment is concerned - you may also need to apply traffic arrangement systems.

General rules and guidance for safe distances from overhead power lines are provided in HSE Guidance Note *Avoidance of danger from overhead electric power lines*.⁽³⁾ Part III of PUWER describes general precautions for mobile work equipment.

The ACOP says:

Proximity hazards

265 You should take suitable measures to minimise the risks from lifting equipment due to its proximity to other objects.

266 Where anyone is working near the wheel tracks of an overhead crane, the crane should not be allowed to approach within 6 m of them if they would be liable to be struck by it.

Key terms

Proximity hazard

A danger when lifting equipment is used near to it.

Derating

Here the ACOP is concerned with a way to control risk by reducing the safe load at which lifting equipment operates; in this way, an additional factor of safety is provided.

The ACOP says:

Derating

274 Where appropriate, the safe working load of the lifting equipment should be reduced to take into account the environment and mode in which it is being used.

Key terms

Safe working load

The maximum load that the equipment may safely lift.

SWL

Safe working load.

Reduction in SWL

A temporary adjustment, by a competent person, in particular circumstances, involving lowering the safe lifting capacity of the equipment.

Case study: Dockside

Look at the case study on page 43. The load, which had been imposed on the crane in lifting the coil at the far side of the ship, exceeded its SWL. The crane should have been derated for lifting at this radius. It would not then have been capable of the coil lifting operation and the tragic consequences of the case would have been avoided.

Lifting persons using lifting equipment not designed for the purpose

Ideally, only lifting equipment designed for the purpose should be used for lifting people. However, the ACOP takes account of the fact that other lifting equipment can be used for this purpose, in certain circumstances, and addresses the risks involved.

You need know:

- the precautions to take when considering specific equipment to use for lifting people such as reducing the equipment's SWL;
- how to ensure good communication between those controlling the lifting operation and those being lifted;
- effective ways to communicate at a distance.

The ACOP says:

Lifting of persons

- 276 You should ensure that where persons are lifted by lifting equipment primarily designed for lifting loads other than persons, the control position of the lifting equipment is manned at all times.**
- 277 You should ensure that persons being lifted on such equipment have a reliable means of communication with the equipment operator or some other responsible person.**
- 280 You should ensure that in the event of failure of the lifting equipment that the persons being lifted are not exposed to danger and a reliable means of rescue is available.**

Key terms

Control position

The position from which the controls of the lifting equipment are operated.

Means of communication

Radio and other communication devices, signals etc as a way of getting information between the passengers and the equipment operator.

Case study: Retail warehouse

An employee of a retail clothing company was seriously injured when she fell 4 m from the raised forks of a fork-lift truck. An improvised platform had been made to fit across the truck's forks. During stock checking in the clothing warehouse, it was the practice to use the fork-lift truck in this way to check stock on the higher racks. There was no means of securing the platform on the truck's forks, and on this occasion, it toppled and the employee fell to the ground. The company was prosecuted.

Overload

Here the ACOP provides for the exceptional circumstances in which lifting equipment lifts a load greater than its SWL.

You need to know:

- what to do when the SWL of the equipment is not known OR the weight of the load is not known;
- precautions to take when equipment is used beyond its SWL (eg for the purposes of testing).

The ACOP says:

Overload

281 A load greater than the safe working load should not be lifted except where, for the purposes of a test, the competent person requires it.

Key terms

Competent person

Individual authorised to carry out specific instructions. A competent person must have appropriate practical and theoretical knowledge and experience. (See regulation 9 for a fuller definition.)

Pre-use checking

This is about providing employees with information and training so that they can check lifting equipment. Users are in the best position to identify faults in equipment. Employers need to ensure that employees have appropriate training and instructions to be able to make sure that the lifting equipment is safe to use.

You should know:

- the purpose of pre-use checks;
- when to carry out pre-use checks;
- that lifting accessories also require pre-use checks.

Key terms

Safe to use

The objective of pre-use checking: that is, to ensure that the lifting equipment is safe to use and free from obvious faults or defects.

Case study: DIY timber warehouse

Difficulties in unloading can arise from limited working space and inefficient storage in the warehouse.

This accident occurred despite the stores being well managed and maintained and there being adequate, unobstructed space. It was due to defects in the lifting equipment which would have been evident if the equipment had been checked before the unloading operation had been carried out.

A lift truck driver reversed to withdraw the forks of the truck from beneath a load of banded timber. As he reversed, he tilted the mast slightly to enable him to withdraw the forks. While he was looking backwards, the two front bundles fell forward and burst their loads. They collapsed on, and seriously injured, a trailer driver who was standing close to the operation.

The accident investigation found that the lift truck's fork blades were of different lengths and slightly different heights. The bearers on which the load was landed didn't provide adequate clearance for the fork blades to be withdrawn, so they dragged the bearers and propelled the load of timber forward.

Continuing integrity: PUWER regulation 5

This is about the storage of lifting accessories. It is associated with the requirement of PUWER regulation 5 that work equipment be maintained in an efficient state, in efficient working order and in good repair.

You should know:

- the kinds of deterioration that can affect accessories in storage and what can be done to prevent problems arising from deterioration;
- when to seek advice from manufacturers and suppliers.

The ACOP says:

Continuing integrity: regulation 5 of PUWER

289 You should ensure that lifting accessories are stored in conditions that do not lead to damage or deterioration.

Key terms

Damage or deterioration (of accessories)

The harmful effects of unsuitable storage or environments on the integrity of accessories.

Case study: Fabrication engineering

A steel erector was seriously injured when he was struck by a steel pipe weighing a tonne. It had slipped from a chain sling while being lifted into position by a telescopic jib crane.

Investigation revealed that many things contributed to the accident. The method of slinging was not adequate as there was no positive location for the sling to prevent it slipping. The chain sling was simply wrapped twice around the pipe and hooked to itself and then to the crane.

The condition of the sling was suspect; several links were badly corroded. It provided only a few good links to which the chain hook could be fastened. So the pipe was very loosely wrapped.

The lifting equipment at the site had been poorly maintained and there were no provisions for organised and secure storage of slings, chains and other lifting accessories.

Activity

- 1 Regulation 8(1)(a)
Before you do this activity, you may want to work through the rest of this open learning guidance. As a minimum, make sure you understand all of regulation 8. Then, using the details in the DIY timber warehouse example just given (page 52), list the points which do not comply with the regulation.
- 2 Regulation 8(1)(c)
How many accidents per year are recorded where you work which are caused by, or involve, lifting equipment (excluding fork-lift trucks)?

Feedback on page 78.

Self-assessment questions

- 1 In planning, what vital requirement governs the selection of lifting equipment?
- 2 A properly proposed lifting plan will be based on a risk assessment. What are the key factors contributing to a safely planned operation?
- 3 What are the essential requirements of the 'competent person' who devises the plan?
- 4 In which circumstances may a written plan be required?
- 5 What two parts should a plan for lifting operations deal with?
- 6 Complete the statement: Under this regulation employers must ensure that loads are not moved over areas which are _____ and _____.
- 7 What requirements concerning loads left suspended MUST be met?
- 8 What must employers ensure when a lifting operation cannot be viewed by the operator using the lifting equipment?
- 9 What must be prevented in situations like this?
- 10 What should be taken into account to ensure that lifting accessories used for securing loads are compatible?
- 11 What authorisation should be given before lifting equipment may be operated?
- 12 Complete the statement (more than one word is needed): Employers must ensure that appropriate measures are taken to prevent the load or part of it _____.
- 13 How can it be initially checked that the operation to lift a freely suspended load can be completed safely?
- 14 What are employers' responsibilities when weather and other conditions seriously affect equipment and endanger people using it?
- 15 What needs to be taken into account when considering the location for using lifting equipment?
- 16 What is required if a lifting operation could subject the equipment to excessive overturning movements?
- 17 Complete the statement: Employers must ensure that suitable checks are in place to prevent lifting equipment from _____, _____, _____ and _____.
- 18 What type of operation, which could involve lifting equipment, should be avoided?
- 19 What action should be taken when a proximity hazard is identified?
- 20 What key considerations need to be taken into account when derating lifting equipment?
- 21 What is the first requirement when lifting equipment is used for lifting people?
- 22 Complete the statement: When people are lifted by lifting equipment which is not made for the purpose, means of communication must be available between _____ and _____.
- 23 What two requirements must be met in the event of failure of equipment which is used for lifting people?

- 24 What is the one and only permitted use of lifting equipment above its SWL?
- 25 Who must be present when equipment is used in this way?
- 26 How can employers ensure that lifting equipment is regularly checked and safe to use?
- 27 What is the employer's duty regarding keeping lifting accessories?

Feedback on page 78.

Regulation 9

Thorough examination and inspection

Key points

Regulation 9 concerns the thorough examination of lifting equipment: the detailed and specialised examination by a competent person. The examination required by this regulation is similar to thorough examinations required by previous sector-specific legislation such as the Factories Act 1961.

The regulation is in seven parts.

Parts 1–4 contain the main provisions for the thorough examination of lifting equipment:

- before it is put into service for the first time;
- after installation or reassembly;
- during its exposure to conditions which cause deterioration; AND
- of the requirement for evidence of the last such examination when the equipment is used outside the undertaking.

Parts 5–7 deal with exclusions and matters relating to previous regulations.

Regulation 9 states:

(1) Every employer shall ensure that before lifting equipment is put into service for the first time by him it is thoroughly examined for any defect unless either –

- (a) the lifting equipment has not been used before; and*
- (b) in the case of lifting equipment for which an EC declaration of conformity could or (in the case of a declaration under the Lift Regulations 1997) should have been drawn up, the employer has received such declaration made not more than 12 months before the lifting equipment is put into service;*

or, if obtained from the undertaking of another person, it is accompanied by physical evidence referred to in paragraph (4).

(2) Every employer shall ensure that, where the safety of lifting equipment depends on the installation conditions, it is thoroughly examined –

- (a) after installation and before being put into service for the first time; and*
- (b) after assembly and before being put into service at a new site or in a new location,*

to ensure that it has been installed correctly and is safe to operate.

(3) Subject to paragraph (6), every employer shall ensure that lifting equipment which is exposed to conditions causing deterioration which is liable to result in dangerous situations is –

- (a) thoroughly examined –*

- (i) in the case of lifting equipment for lifting persons or an accessory for lifting, at least every 6 months;
 - (ii) in the case of other lifting equipment, at least every 12 months; or
 - (iii) in either case, in accordance with an examination scheme; and
 - (iv) each time that exceptional circumstances which are liable to jeopardise the safety of the lifting equipment have occurred; and
- (b) if appropriate for the purpose, is inspected by a competent person at suitable intervals between thorough examinations,

to ensure that health and safety conditions are maintained and that any deterioration can be detected and remedied in good time.

(4) Every employer shall ensure that no lifting equipment –

- (a) leaves his undertaking; or
- (b) if obtained from the undertaking of another person, is used in his undertaking,

unless it is accompanied by physical evidence that the last thorough examination required to be carried out under this regulation has been carried out.

(5) This regulation does not apply to winding apparatus to which the Mines (Shafts and Winding) Regulations 1993**(a)** apply.

(6) Where lifting equipment was before the coming into force of these Regulations required to be thoroughly examined by a provision specified in paragraph (7), the first thorough examination under paragraph (3) shall be made before the date by which a thorough examination would have been required by that provision had it remained in force.

(7) The provisions referred to in paragraph (6) are –

- (a) section 22(2), 25(2), 26(1)(d) and 27(2) of the Factories Act 1961**(b)**;
- (b) regulations 34(2) and 37(1) of the Shipbuilding and Ship-repairing Regulations 1960**(c)**;
- (c) regulations 28(3), 40 and 46(1) of the Construction (Lifting Operations) Regulations 1961**(d)**;
- (d) regulations 3(1) and (2) and 6(1) of the Offices, Shops and Railway Premises (Hoists and Lifts) Regulations 1968**(e)**;
- (e) regulations 6(1)(c) of and Part III of Schedule 1 to the Offshore Installations (Operational Safety, Health and Welfare) Regulations 1976**(f)**;
- (f) regulation 15 of the Docks Regulations 1988**(g)**.

(a) SI 1993/302.

(b) 1961 c.34; sections 22(2) and 27(2) were amended by SI 1992/195.

(c) 1960/1932; amended by SI 1992/195.

(d) 1961/1581; amended by SI 1992/195.

(e) 1968/849; amended by SI 1992/195.

(f) SI 1976/1019.

(g) SI 1988/1655; amended by SI 1992/195.

Key terms	
Defect	Fault or weakness in equipment, or any of its components, which could arise during the manufacture, construction, installation, OR when in use. Could be due to damage, wear, deterioration, factors inherent in the materials used.
Thorough examination	The term used in this regulation to mean a systematic and specialised process of examination by a competent person for any defect in lifting equipment.
Competent person	The individual nominated by the employer to carry out thorough examinations on the basis of his or her level of knowledge of the equipment, defects and their causes, methods of testing and fault diagnosis. The person must be independent from the employer's line management. The competent person can be in-house or from an external organisation such as an insurance company.
Conditions causing deterioration	Atmospheric or environmental conditions AND/OR operation conditions which are likely to cause damage to lifting equipment.

Testing

The level of examination, and the requirement for testing, is based on an assessment of risk and determined by the competent person. Some overload tests can cause damage to lifting equipment and it is crucial that the competent person takes account of manufacturer's instruction and other information.

The ACOP says:

Testing

301 The competent person should decide whether a test is necessary. The nature of the test method will also be a matter for a competent person: they should determine the most appropriate method of carrying it out.

Regulation 9(1): initial thorough examination

This part of the regulation is all about carrying out a thorough examination before the lifting equipment is put into operation. The extent of the examination depends on the extent of the information available to the competent person. For new lifting equipment, a thorough examination may not be needed since it is assumed this has been done by the manufacturer or supplier. Confirmation of this is through the Declaration of Conformity.

If used equipment is supplied with current evidence that a thorough examination has been carried out, it does not require a further thorough examination. However,

note what the ACOP says about equipment that needs to be installed.

The ACOP says:

304 A thorough examination is required after substantial or significant modification or repair.

Regulation 9(2): installation and reconfiguration

Thorough examination after installation and reconfiguration should be based on risk assessment. An examination does not apply to mobile lifting equipment.

You need to know:

- what is required when the configuration of lifting equipment is changed while it is still at its new location;
- the meaning of 'installation', 'reconfiguration', 'put into service' and 'in-service operation'.

The ACOP says:

Regulation 9(2): installation and reconfiguration

305 You should ensure that where lifting equipment is installed in a new location or reconfigured it is thoroughly examined by a competent person to ensure that it has the adequate strength and stability for its intended use.

Key terms

<i>Installation</i>	When lifting equipment is erected or built on-site.
<i>Put into service</i>	When the lifting equipment is put into use for the first time.
<i>In-service operation</i>	When the equipment is handed over to production personnel for day-to-day operations.

Regulation 9(3)(a): in-service thorough examination

Under regulation 9(3) employers choose whether to have a thorough examination of lifting equipment EITHER at set intervals as specified in the regulation, OR according to an examination scheme.

The competent person needs to examine thoroughly the parts of the equipment specified within the examination scheme; these should include the parts that are subject to wear and tear, and deterioration and which could lead to dangerous situations.

Employers are required to produce:

- either a written examination scheme; OR
- a current examination report (if following a specified period approach to the carrying out of a thorough examination).

The ACOP states the requirements of/for examination schemes.

The ACOP says:

- 318 The examination scheme may be drawn up by the user, owner, manufacturer or some other independent party provided they have the necessary competence.
- 319 The examination scheme drawn up by the competent person should identify and specify those parts of the lifting equipment that should be thoroughly examined.
- 320 The examination scheme should specify the intervals at which the lifting equipment (or individual parts thereof) should be thoroughly examined and, where appropriate, those parts that need to be tested.
- 321 Any examination scheme for lifting equipment should take account of:
- (a) its condition;
 - (b) the environment in which it is to be used; and
 - (c) the number of lifting operations and loads lifted.
- 322 The examination scheme need not necessarily be preserved in the form of a document. It should however be capable of being reproduced as a written copy when required; it should be secure from loss or unauthorised modification and it should be authenticated by the competent person preparing the scheme.
- 323 You should inform the competent person of any changes in use of the lifting equipment which may affect the examination scheme either:
- (a) where these changes have occurred since the last thorough examination was carried out; or
 - (b) are expected to occur before the next thorough examination is due.
- 324 The competent person should decide what changes may need to be made to the examination scheme.
- 325 Different items or parts of the lifting equipment may be thoroughly examined at different intervals, taking into account the degree of risk associated with each item or part.

Key terms

<i>Examination scheme</i>	A specification, usually in writing, of what must be examined, how and when the examination will be carried out.
<i>Examination report</i>	The record of the findings of the thorough examination and the actions which ensue from it.

Case study: Residential home

Under the Health and Safety at Work etc Act 1974, lifts in the majority of industries have been subject to similar inspection standards as those now required under LOLER. However, until LOLER, passenger lifts in residential homes were not required to undergo a thorough examination every six months under any specific regulation.

A passenger lift in one such home was carrying a small group of elderly residents, when the lift doors jammed. The residents were trapped inside the lift for over an hour before a technician was able to free the doors and enable the group to leave the lift. Because of the incident, two individuals suffered panic attacks resulting in breathing difficulties; a third became worryingly disorientated for a period. All passengers were badly shaken in one way or another.

During the review of the incident, it emerged that neither the passenger lift nor its component parts had been examined in the three years since the lift was installed.

Regulation 9(3)(b): inspections at suitable intervals

This part of the regulation is about carrying out inspections to the lifting equipment where the risks which were identified through the risk assessment could be addressed through regular inspection. Examples of conditions that can be detected by inspection include:

- rapid wear which arises from using the equipment in severe environments, as is often the case in construction;
- when there is wear through repeated operations (eg of a hoist interlock);
- malfunction (eg of a rated capacity indicator);
- where tampering of safety devices may occur (eg defeating an interlock).

In some cases, weekly inspection AND/OR daily checks may be advisable:

- for the operation of limiters and indicators on cranes;
- checking the tyre pressures of mobile equipment;
- checking that no components are missing.

BS 7121⁽²⁾ provides further recommendations for weekly inspections and daily checks; PUWER provides information on the purpose and extent of the inspection, and the requirements for the competent person.

The ACOP says:

Regulation 9(3)(b)

332 Where your risk assessment under regulation 3 of the Management of Health and Safety at Work Regulations 1992 has identified a significant risk to the operator or other workers from the use of the lifting equipment, a suitable inspection should be carried out.

333 The frequency and extent of the inspections required will depend on the potential risk from the lifting equipment. The inspection should include, where appropriate, visual checks and functional tests.

334 You should ensure that the persons who determine the nature of the inspections required and who carry out the inspections are competent to do so.

Regulation 9(4): physical evidence accompanying equipment used outside the undertaking

If you receive lifting equipment from another operation you must have evidence of the last time that the thorough examination was carried out.

You need to know:

- the nature of suitable evidence of examination (for instance a paper summary report or tagging);
- what information should accompany the equipment including
 - the name and address of the duty holder for whom the report was made;
 - the address of the premises at which the thorough examination was carried out;
 - information which identified the equipment;
 - the date of the last thorough examination;
 - when the next examination is due;
 - the SWL of the equipment and any components; AND
 - a statement that the equipment is safe to operate.

Other points to note are:

- Anyone using lifting equipment should be able to ascertain that it has been thoroughly examined and is likely to be safe to use. So it is important that when used outside its normal place of work the equipment is accompanied by appropriate evidence that this thorough examination has been carried out.
- An 'undertaking' is the employer's business. If you transfer lifting equipment, either temporarily or permanently to another employer, you should ensure adequate evidence is transferred with it that the last thorough examination has been carried out. This would normally be a paper copy of the last examination report but may be, if it is more convenient, a copy of the report on computer disc or other electronic format.

Exclusions and provisions which are superseded

This covers parts 5–7 of the regulation. The effects on other legal instruments of regulation 9 are set down. They refer to:

- lifting equipment to which the regulation does NOT apply – 9(5);
- the situation in which equipment was examined under other provisions which are superseded by regulation 9. The dates of their first examination under regulation 9 will not be before the dates originally set – 9(6).

The other provisions referred to, and the regulations concerned, are given in 9(7).

Activity

- 1 Describe what currently happens in your situation to check the strength, stability and operational safety of lifting equipment when it is installed or reconfigured on-site.
- 2 From the point of view as an employer, describe how your lifting equipment is currently thoroughly examined. Then list any further factors you need to take into account to implement the requirements of regulation 9.

Feedback on page 79.

Self-assessment questions

- 1 List the circumstances in which a thorough examination of lifting equipment is required.
- 2 What is the term for the person who must carry out thorough examinations? What capabilities are required?
- 3 Where periodic thorough examinations are required, what intervals apply to:
 - (a) lifting equipment for lifting people?
 - (b) an accessory for lifting?
 - (c) other lifting equipment?
- 4 What is the alternative to prescribed intervals governing thorough examinations?
- 5 What are the responsibilities of the employer and the competent person in relation to in-service thorough examination as explained in the ACOP?
- 6 When should lifting equipment which is installed on-site be subject to thorough examination?
- 7 What is the purpose of thorough examinations in situations described in question 6?
- 8 Explain the alternatives to the frequency of thorough examinations.
- 9 For each alternative, what are the duties of the competent person?
- 10 What must employers provide when lifting equipment is used outside the undertaking?
- 11 Why do they need to do this?
- 12 What effect does regulation 9(5) have on the Mines (Shafts and Winding) Regulations 1993?
- 13 What is the key requirement for those drawing up and preparing examination schemes for lifting equipment?
- 14 List what needs to be specified in examination schemes.
- 15 What must be taken into account in preparing examination schemes and in keeping them up to date?
- 16 What forms can schemes of examination take?

Feedback on page 80.

Regulation 10

Reports and defects

Key points

This regulation deals with formally reporting the findings of thorough examinations (the subject of regulation 9). It sets out:

- what must be reported;
- other necessary information;
- who must and who should receive copies of reports;
- how soon reports are issued;
- the duties arising from reports.

The regulation has four main parts, and there is a Schedule setting out the information which must be contained in a report (see page 74).

Regulation 10 states:

(1) A person making a thorough examination for an employer under regulation 9 shall –

- (a) notify the employer forthwith of any defect in the lifting equipment which in his opinion is or could become a danger to persons;*
- (b) as soon as is practicable make a report of the thorough examination in writing authenticated by him or on his behalf by signature or equally secure means and containing the information specified in Schedule 1 to –*
 - (i) the employer; and*
 - (ii) any person from whom the lifting equipment has been hired or leased;*
- (c) where there is in his opinion a defect in the lifting equipment involving an existing or imminent risk of serious personal injury send a copy of the report as soon as is practicable to the relevant enforcing authority.*

(2) A person making an inspection for an employer under regulation 9 shall –

- (a) notify the employer forthwith of any defect in the lifting equipment which in his opinion is or could become a danger to persons;*
- (b) as soon as is practicable make a record of the inspection in writing.*

(3) Every employer who has been notified under paragraph (1) shall ensure that the lifting equipment is not used –

- (a) before the defect is rectified; or*
- (b) in a case to which sub-paragraph (c) of paragraph 8 of Schedule 1 applies, after a time specified under that sub-paragraph and before the defect is rectified.*

(4) In this regulation “relevant enforcing authority” means –

- (a) where the defective lifting equipment has been hired or leased by the employer, the Executive; and*
- (b) otherwise, the enforcing authority for the premises in which the defective lifting equipment was thoroughly examined.*

The regulation requires the competent person to notify the enforcing authority (Local Authority or HSE) of defects involving existing or imminent risks of serious personal injury. Examples of such injuries include:

- amputation;
- electric shock;
- fracture other than to fingers, thumbs or toes.

These are examples of reportable major injuries under the RIDDOR Regulations; if you require further information about these, please contact HSE Infoline Tel: 0845 345 0055.

You need to know:

- the meaning and purpose of the term 'forthwith' (it is intended to ensure that the competent person reports immediately) and of the phrase 'as soon as practicable' (it is intended to ensure that there is no unnecessary delay);
- that the duty to report follows defects found after a thorough examination (NOT after an inspection carried out between thorough examinations);
- that the competent person must report formally, including to relevant enforcing authorities.

Reports must be in usable formats and contain the information detailed in Schedule 1 of LOLER.

The ACOP says:

345 Where the competent person identifies defects which need to be made good within a specified timescale, they should submit the report promptly to allow the employer to take the necessary action within the required period.

346 In normal circumstances the competent person should complete the report and forward it within 28 days of the thorough examination.

Key terms

<i>Defect</i>	Fault or weakness in equipment, or any of its components, which could arise during the manufacture, construction, installation, OR when in use. Could be due to damage, wear, deterioration, factors inherent in the materials used.
<i>Authenticated report</i>	A report in accordance with Schedule 1 and which is signed permanently by the competent person who carried out the examination.

Self-assessment questions

- 1 In relation to thorough examinations of lifting equipment under regulation 9 by a competent person what must be done:
 - (a) 'forthwith';
 - (b) 'as soon as is practicable'?
- 2 What is the employer's duty when notified of a defect in lifting equipment by the competent person?
- 3 What would be the relevant enforcing authority for lifting equipment that has been hired or leased?

Feedback on page 81.

Regulation 11

Keeping of information

Key points

Regulation 11 is the final regulation concerned with thorough examinations of lifting equipment. It deals with the need for a secure and accessible system of record-keeping for the reports made under regulation 10. It covers:

- keeping EC declarations of conformity;
- the length of time records must be kept.

Regulation 11 states:

(1) Where, after the coming into force of these Regulations, an employer obtaining lifting equipment to which these Regulations apply receives an EC declaration of conformity relating to it, he shall keep the declaration for so long as he operates the lifting equipment.

(2) The employer shall ensure that the information contained in –

- (a) every report made to him under regulation 10(1)(b) is kept available for inspection –*
 - (i) in the case of a thorough examination under paragraph (1) of regulation 9 of lifting equipment other than an accessory for lifting, until he ceases to use the lifting equipment;*
 - (ii) in the case of a thorough examination under paragraph (1) of regulation 9 of an accessory for lifting, for two years after the report is made;*
 - (iii) in the case of a thorough examination under paragraph (2) of regulation 9, until he ceases to use the lifting equipment at the place it was installed or assembled;*
 - (iv) in the case of a thorough examination under paragraph (3) of regulation 9, until the next report is made under that paragraph or the expiration of two years, whichever is later;*
- (b) every record made under regulation 10(2) is kept available until the next such record is made.*

You need to be aware of the need to keep records of thorough examination and other documents, and of appropriate places for keeping them. Effective record-keeping assists with the management of lifting equipment.

Records must be:

- readily available to enforcing authorities and others who need to see them;
- secure and capable of being reproduced in written form.

Key terms

EC declaration of conformity

A declaration that the lifting equipment meets the requirements of the Machinery Directive (implemented in the UK by the Supply of Machinery (Safety) Regulations 1992).

Reports of thorough examination

Formal statements by competent persons of the outcomes and findings of thorough examination of lifting equipment.

Self-assessment questions

- 1 How long must employers keep EC documents that apply to lifting equipment in their use?
- 2 How long must the following reports of lifting equipment be kept:
 - (a) reports of lifting equipment examined before being used for the first time;
 - (b) reports of accessories for lifting examined before being used for the first time;
 - (c) reports of lifting equipment examined after reinstallation or reassembly at a new location;
 - (d) reports of lifting equipment examined periodically or under an examination scheme?

Feedback on page 81.

Regulation 12

Exemption for the armed forces

Key points

This regulation is to allow the Secretary of State for Defence, by a certificate in writing, to exempt armed forces for any requirement of LOLER in the interests of national security (eg during times of emergency or conflict).

Regulation 12 states:

(1) The Secretary of State for Defence may, in the interests of national security, by a certificate in writing exempt any of the home forces, any visiting force or any headquarters from any of the requirements of these Regulations and any such exemption may be granted subject to conditions and to a limit of time and may be revoked by the said Secretary of State by a certificate in writing at any time.

(2) In this regulation –

- (a) “the home forces” has the same meaning as in section 12(1) of the Visiting Forces Act 1952**(a)**;*
- (b) “headquarters” has the same meaning as in article 3(2) of the Visiting Forces and International Headquarters (Application of Law) Order 1965**(b)**;*
- (c) “visiting force” has the same meaning as it does for the purposes of any provision of Part I of the Visiting Forces Act 1952.*

(a) 1952 c.67.

(b) SI 1965/1536, to which there are amendments not relevant to these Regulations.

Regulations 13 and 14 Amendments to other Regulations

Key points

Regulations 13 and 14 of LOLER amend the following other existing Regulations:

- Shipbuilding and Ship-repairing Regulations 1960;
- Docks Regulations 1988.

Regulation 13 states:

Regulation 2 (application) of the Shipbuilding and Ship-repairing Regulations 1960 is amended –

- (a) in paragraph (2) by substituting for the word “31” wherever occurring the word “48”; and*
- (b) in paragraph (4) by omitting the word “32”.*

Regulation 14 states:

The Docks Regulations 1988(a) are amended –

- (a) in regulation 13(4) by substituting the words “thorough examination under regulation 9 of the Lifting Operations and Lifting Equipment Regulations 1998” for the words “test under regulation 14”;*
- (b) by revoking regulations 14 and 15;*
- (c) by revoking paragraphs (3), (4), (5), (7) and (8) of regulation 16; and*
- (d) by revoking regulation 17.*

(a) SI 1988/1655, amended by SI 1992/3073.

These amendments bring the requirements of the Shipbuilding and Ship-repairing Regulations and the Docks Regulations into line with LOLER. The amendments are needed to ensure that the requirements of the Directive are fully implemented and a consistent approach is adopted in both sets of Regulations.

Regulations 15 and 16

Repeal of provisions in other Acts

Key points

Provisions made in the following Acts are repealed by these LOLER Regulations.

They are:

- Factories Act 1961;
- Mines and Quarries Act 1954.

Regulation 15 states:

Sections 22, 23 and 25 to 27 of the Factories Act 1961(a) are repealed.

(a) 1961 c.34.

Regulation 16 states:

Section 85 of the Mines and Quarries Act 1954(a) is repealed.

(a) 1954 c.70

Regulation 17

Revocation of instruments

Key points

By this regulation LOLER revokes other legal instruments entirely or to a limited extent as specified in Schedule 2.

Regulation 17 states:

The instruments specified in column 1 of Schedule 2 are hereby revoked to the extent specified in column 3 of that Schedule.

Schedule 1

Information to be contained in a report of a thorough examination

- 1 *The name and address of the employer for whom the thorough examination was made.*
 - 2 *The address of the premises at which the thorough examination was made.*
 - 3 *Particulars sufficient to identify the lifting equipment including where known its date of manufacture.*
 - 4 *The date of the last thorough examination.*
 - 5 *The safe working load of the lifting equipment or (where its safe working load depends on the configuration of the lifting equipment) its safe working load for the last configuration in which it was thoroughly examined.*
 - 6 *In relation to the first thorough examination of lifting equipment after installation or after assembly at a new site or in a new location –*
 - (a) *that it is such a thorough examination;*
 - (b) *(if such be the case) that it has been installed correctly and would be safe to operate.*
 - 7 *In relation to a thorough examination of lifting equipment other than a thorough examination to which paragraph 6 relates –*
 - (a) *whether it is a thorough examination –*
 - (i) *within an interval of 6 months under regulation 9(3)(a)(i);*
 - (ii) *within an interval of 12 months under regulation 9(3)(a)(ii);*
 - (iii) *in accordance with an examination scheme under regulation 9(3)(a)(iii);*

or

 - (iv) *after the occurrence of exceptional circumstances under regulation 9(3)(a)(iv);*
 - (b) *(if such be the case) that the lifting equipment would be safe to operate.*
- 8 *In relation to every thorough examination of lifting equipment –*
 - (a) *identification of any part found to have a defect which is or could become a danger to persons, and a description of the defect;*
 - (b) *particulars of any repair, renewal or alteration required to remedy a defect found to be a danger to persons;*
 - (c) *in the case of a defect which is not yet but could become a danger to persons –*
 - (i) *the time by which it could become such a danger;*
 - (ii) *particulars of any repair, renewal or alteration required to remedy it;*
 - (d) *the latest date by which the next thorough examination must be carried out;*
 - (e) *where the thorough examination included testing, particulars of any test;*
 - (f) *the date of the thorough examination.*
- 9 *The name, address and qualifications of the person making the report; that he is self-employed or, if employed, the name and address of his employer.*
- 10 *The name and address of a person signing or authenticating the report on behalf of its author.*
- 11 *The date of the report.*

Schedule 2

Revocation of instruments

<i>(1) Title</i>	<i>(2) Reference</i>	<i>(3) Extent of revocation</i>
<i>The Quarries (General) Regulations 1956</i>	<i>SI 1956/1780</i>	<i>Regulations 13 and 14.</i>
<i>The Quarries (Ropeways and Vehicles) Regulations 1958</i>	<i>SI 1958/2110</i>	<i>The whole Regulations.</i>
<i>The Shipbuilding and Ship-repairing Regulations 1960</i>	<i>SI 1960/1932</i>	<i>In regulation 3 the definitions of "lifting appliance" and "lifting gear"; regulations 21 and 31 to 47.</i>
<i>The Shipbuilding (Particulars of Annealing) Order 1961</i>	<i>SI 1961/117</i>	<i>The whole order.</i>
<i>The Shipbuilding (Lifting Appliances etc, Forms) Order 1961</i>	<i>SI 1961/431</i>	<i>The whole order.</i>
<i>The Construction (Lifting Operations) Regulations 1961</i>	<i>SI 1961/1581</i>	<i>The whole Regulations.</i>
<i>The Construction (Lifting Operations) Reports Order 1962</i>	<i>SI 1962/225</i>	<i>The whole order.</i>
<i>The Construction (Lifting Operations) Prescribed Particulars Order 1962</i>	<i>SI 1962/226</i>	<i>The whole order.</i>
<i>The Hoists Exemption Order 1962</i>	<i>SI 1962/715</i>	<i>The whole order.</i>
<i>The Hoists Exemption (Amendment) Order 1967</i>	<i>SI 1967/759</i>	<i>The whole order.</i>
<i>The Offices, Shops and Railway Premises (Hoists and Lifts) Regulations 1968</i>	<i>SI 1968/849</i>	<i>The whole Regulations.</i>
<i>The Offshore Installations (Operational Safety, Health and Welfare) Regulations 1976</i>	<i>SI 1976/1019</i>	<i>The whole Regulations.</i>
<i>The Hoists and Lifts (Metrication) Regulations 1983</i>	<i>SI 1983/1579</i>	<i>The whole Regulations.</i>
<i>The Construction (Metrication) Regulations 1984</i>	<i>SI 1984/1593</i>	<i>The whole Regulations.</i>

*The Health and Safety
(Miscellaneous Modifications)
Regulations 1989*

SI 1989/1141 *The whole Regulations.*

*The Lifting Plant and Equipment
(Records of Test and
Examinations etc) Regulations 1992*

SI 1992/195 *The whole Regulations.*

*The Construction (Health, Safety
and Welfare) Regulations 1996*

SI 1996/1592 *Paragraph 3 of Schedule 9*

Feedback and answers

Regulations 1–3: Self-assessment questions

- 1 The Lifting Operations and Lifting Equipment Regulations 1998.
- 2 5 December 1998.
- 3 It is a declaration which complies with the requirements of regulation 22 of the 1992 Regulations; Article 12.1 of Council Directive 89/6886/EEC(b) relating to personal protective equipment; and Regulation 8(2)(d) of the Lifts Regulations 1997.
- 4 The Health and Safety Executive.
- 5 Work equipment, including attachments, used for lifting or lowering loads.
- 6 (c) Wherever the Health and Safety at Work etc Act 1974 applies.
- 7 True.
- 8 No, LOLER does not apply.
- 9 That the shore employer has taken all reasonable steps to ensure compliance with the Merchant Shipping requirements.
- 10 True.
- 11 False.
- 12 An operation in which a ship's work equipment is used by people, other than the master and crew, who are liable to be exposed to a health and safety risk.
- 13 Lifting equipment provided for use by him or equipment used by an employee of his, or the self-employed, at work.
- 14 A self-employed person for lifting equipment he uses at work; a person who has control of lifting equipment, a person who uses lifting equipment or the way lifting equipment is used; and an employee who is allowed by his employer to provide his own lifting equipment.

Regulation 4: Activity

In your situation, the assessment and allocation of lifting equipment may be well under control and operate without exposing users and others to risk of accident arising from instability. If not, plan how to make improvements. Remember also that individuals who operate lifting equipment need to be fully informed about the capability of their equipment to withstand destabilising conditions.

Regulation 4: Self-assessment questions

- 1 Adequate strength and stability.
- 2 The load to be lifted or anything attached to it must also be of adequate strength.
- 3 To ensure that lifting equipment is not used unless the requirements of 4(a) and 4(b) are met.
- 4 Load refers to the weight of the object to be lifted plus the weight of any accessories used in the lifting operation.
- 5 Employers must assess equipment and ensure that all equipment used is strong enough for the proposed use.
- 6 Any combination of forces which could apply, eg forces due to movement of the equipment or the load.
- 7 Factor of safety.
- 8 The combination of destabilising forces which could adversely affect equipment stability.
- 9 It should be sufficiently resistant to overturning.

- 10 Equipment should not be used unless they are in place and operating effectively.
- 11 Mobile equipment and equipment which is assembled and then dismantled at the site of the lifting operations.
- 12 The employer should ensure that this type of equipment is used such that it will be stable under all foreseeable conditions.
- 13 The nature of the ground and other surfaces on which the equipment might be used.
- 14 Suitable devices should be fitted which minimise the risk of derailment.
- 15 There are four requirements:
 - a surface sufficiently firm to support rails;
 - rails need to have an even running surface;
 - rails need to be properly joined;
 - rails need to be laid so that equipment and its load can move freely and without danger of derailment.
- 16 That they are inflated to the correct pressure according to the load being lifted.
- 17 Suitable means of checking tyre pressure.
- 18 That every part of the load and anything attached to it and used in lifting it is of adequate strength.
- 19 They are part of the load.

Regulation 5: Activities

- 1 What did you find when you carried out this basic risk assessment? If you concluded that people could be at risk, you are bound under LOLER to take measures to reduce the risk as much as possible. LOLER requires that a risk assessment be done formally, using a recognised method. If you are unsure what this entails, find out.
- 2 If your reaction was 'What safety records?' or if you found more than five separate incidents, this is an area to look at very carefully. Study the equipment involved. See if there is a particular type that is proving to be problematic.

Regulation 5: Self-assessment questions

- 1 Equipment which is used for lifting people.
- 2 (a) People using the equipment must not be crushed, trapped or struck by, or be able to fall from, the carrier.
(b) People working from the carrier must be prevented from falling from the carrier, or from being crushed, trapped or struck by it.
(c) Devices that stop the carrier from falling must be provided.
(d) People trapped in a carrier must not be exposed to danger and must be able to be freed.
- 3 The 'passengers' (those being lifted). This includes people working from carriers which are not fully enclosed.
- 4 (a) It should only be undertaken in exceptional circumstances when it is not practicable to gain access by less hazardous means.
(b) All necessary precautions are taken, including appropriate supervision and training
- 5 The car should be fully enclosed.
- 6 The carrier must be prevented from falling by using other suitable and effective devices.
- 7 (a) Edge protection should be provided if a fall of more than 2 m could occur.
(b) Gates and barriers should open in a way that prevents people from falling from the carrier.
(c) Floors should be slip-resistant.

Regulation 6: Activity

Are your records complete? Do they accurately give information about the risks in positioning and installing lifting equipment?

Regulation 6: Self-assessment questions

- 1 That lifting equipment is positioned or installed so that safety risks are minimised.
- 2 The four specific risks are:
 - striking a person;
 - a load drifting;
 - a load falling freely;
 - unintended release.
- 3 Regulation 6(1) requires in addition to its particular requirements, that positioning and installation of lifting equipment is otherwise safe.
- 4 The danger of falling into them.
- 5 Where equipment is positioned such that:
 - loads are lifted over people;
 - in its extreme position there is a danger of crushing;
 - trapping points are created.
- 6 Protection in the form of a suitable and substantial enclosure must be provided.
- 7 People are at risk from being struck by the underside of the equipment which at this height is a 'head hazard'.
- 8 Freely suspended loads swinging out of control; runway beams which are not level OR stiff enough.
- 9 Lifting equipment should be fitted with suitable devices (for example multiple ropes or safety gear) which minimise the risk.
- 10 The equipment being unable to maintain its hold on the load.
- 11 Employers have to ensure that devices are designed to minimise the risk of this happening.
- 12 The risks of a person falling down a shaft or hoistway.
- 13 (a) Suitable and substantial gates (or other equally effective means of enclosure).
(b) Efficient interlocking of gates and the hoist.
- 14 (a) 'The gate' . . . 'the landing.'
(b) 'the landing' . . . 'closed'.

Regulation 7: Activity

The activity may have helped you to discover gaps, inconsistencies or errors in the marking of lifting equipment. Any machinery designed for lifting people requires specific markings, as does machinery which may inadvertently be used for lifting people, but which is not designed to do so.

Regulation 7: Self-assessment questions

- 1 Equipment must be appropriately and clearly marked.
- 2 (a) Mark the equipment with its SWL for each configuration.
(b) Keep information about the SWL for each configuration within the equipment.
- 3 When the equipment is designed for lifting persons.
- 4 The characteristics necessary for safe use are identified in the markings provided.
- 5 Safe working load (SWL).
- 6 (a) Where SWL varies within its operating radius.
(b) Where SWL varies with operating radius.
(c) Where SWL changes according to how the equipment is configured.
- 7 (a) It is clearly marked on the equipment.
(b) It is readily available as information to the operator or user.
(c) It is provided automatically by particular load indication devices.
- 8 The assembly should be marked to indicate its safety characteristics to users.
- 9 When its weight is significant in relation to the SWL of the lifting equipment it is to be used with.
- 10 Information to the effect that it is unsuitable in particular applications should be provided by marking, or by making it available to users.
- 11 The maximum number of persons to be carried.
- 12 To indicate on structural elements which could be separated following dismantling the equipment of which they are an integral part.

Regulation 8: Activities

- 1 You could have listed the following – you may have found more:
 - unplanned lifting operation – 8(1)(a);
 - crane used outside its SWL – 8(1)(a);
 - no appropriate supervision – 8(1)(b);
 - not carried out safely – 8(1)(c) – meaning
 - no pre-use check;
 - crane should have been derated;
 - crane used for dragging;
 - load unsecured;
 - unsafe environment.
- 2 HSE has recorded the following: these are national figures relating to the failure, collapse or overturning of lifting equipment.

1992/3	1993/4	1994/5	1995/6	1996/7
723	677	791	780	1085

Regulation 8: Self-assessment questions

- 1 Equipment remains safe for the range of lifting operations for which the equipment might be used.
- 2 It will identify the resources needed, the procedure which applies and the responsibilities of those involved.
- 3 The competent person should possess adequate practical and theoretical knowledge and experience of planning similar lifting operations.
- 4 When two or more items of lifting equipment, such as cranes, are used at the same time to lift a load as well as other complex or unusual lifting operations.
- 5 (a) An initial plan which ensures equipment is suitable for the range of tasks to be done;

- (b) Plans for individual lifting operations to ensure they can be carried out safely.
- 6 'unprotected'; 'occupied by persons'
- 7 (a) Where practicable, people are not present under loads which are left suspended;
 - (b) Access to the danger zone is prevented;
 - (c) The suspended load has been properly secured.
- 8 That a responsible person has the means of communication to guide the operator.
- 9 The load must be prevented from striking anything or any person on its path of travel.
- 10 (a) The attachment points on the load.
 - (b) The environmental conditions.
 - (c) The configuration of their use.
- 11 Authorisation by the person who is responsible for securing, attaching and detaching the load that it is safe to do so.
- 12 'disintegrating while being lifted'
- 13 By first lifting it a safe distance.
- 14 That the use of lifting equipment is halted.
- 15 That there is enough headroom to prevent damage, overloading or loss of control of the equipment. There should also be sufficient site access/egress for the lifting equipment and employers need to consider whether there is sufficient space to safely position and install the equipment.
- 16 The lifting equipment should not be used.
- 17 'tilting'; 'overturning'; 'moving'; 'slipping'
- 18 Dragging loads.
- 19 Suitable measures should be taken to minimise the risks.
- 20 The environment and operating mode proposed.
- 21 The control position of the lifting equipment must always be manned.
- 22 'those lifted'; 'the equipment operator'
- 23 The people being lifted must not be exposed to danger and a reliable means of rescue must be provided.
- 24 For the purpose of testing during a thorough examination.
 - 25 A competent person.
 - 26 By providing employees who operate and use lifting equipment with appropriate training and instruction so that they are able to ensure that the equipment is safe to use.
 - 27 That they are stored in conditions that do not lead to damage or deterioration.

Regulation 9: Activities

- 1 You may rely on a company procedure, instruction, or some other form of written guidance; or perhaps you rely on your employees knowing what to do – and doing it. But under LOLER, such methods are not adequate. It is recommended that you have a formal system of work covering all the activities necessary to ensure that you comply with the regulation.
- 2 You may have listed some of the following. In any case it would be worthwhile to plan what has to be done to comply with regulation 9; for instance:
 - Is the inventory of lifting equipment and lifting accessories up to date and complete?
 - Is the assessment of risks, on which the examination plans are to be based, in a form which can be used?
 - Does the risk assessment cover all the equipment in the inventory?
 - Can you provide a competent person in-house?
 - What competence needs to be brought in from outside?
 - Are the resources for testing currently available in-house?

- What criteria need to be set up to decide whether periodic examination or examination schemes are appropriate for the range of accessories you have?

Regulation 9: Self-assessment questions

- 1 (a) Before it is put into service for the first time;
(b) where installation conditions vary:
 - (i) after installation and before it is put into service for the first time;
 - (ii) after assembly at a new site or location;
- (c) where it is exposed to conditions which cause damage or deterioration;
- (d) each time exceptional circumstances are liable to jeopardise its safety.
- 2 (a) A competent person.
(b) A competent person must have appropriate practical and theoretical knowledge and experience of the lifting equipment to be thoroughly examined.
- 3 (a) At least every 6 months.
(b) At least every 6 months.
(c) At least every 12 months, OR at other intervals prescribed in an examination scheme drawn up by a competent person.
- 4 They must be carried out in accordance with an examination scheme which has been drawn up by a competent person.
- 5 (a) The employer:
 - decides to have the equipment either inspected at prescribed intervals or in accordance with intervals in an examination scheme;
 - informs the competent person of any changes in use of the lifting equipment which may affect the examination scheme;
 - decides which lifting equipment requires thorough examination (see regulation 9(3));
 - decides whether an in-house or independent competent person should carry out the examination;
 - ensures the competent person is appropriate.
- (b) The competent person:
 - decides whether testing is necessary;
 - decides on the nature of the test and the way to carry it out;
 - decides what changes may need to be made to the examination scheme.
- 6 When it is installed or reconfigured in a new location or when the equipment is substantially or significantly modified or repaired.
- 7 To ensure that the equipment has the adequate strength and stability for its intended use.
- 8 The employer can have lifting equipment examined:
 - either at regular intervals, not longer than those specified in the regulation (or shorter if considered appropriate by the competent person); OR
 - in accordance with the intervals specified in the examination scheme.
- 9 The competent person must examine:
 - items of equipment or parts of equipment specified in the examination scheme; OR
 - items of equipment or parts of equipment which could, through deterioration, lead to dangerous situations.
- 10 Evidence that the last inspection required by regulation 9(4)(b) has been carried out must accompany the equipment.
- 11 To ensure that the lifting equipment has been examined according to regulation 9 and that the equipment is safe to use.
- 12 It leaves the regulation of winding apparatus, a type of lifting equipment, within the existing Mines (Shafts and Winding) Regulations 1993.
- 13 They should have necessary competence.

- 14 (a) The parts of the lifting equipment to be examined.
(b) The intervals at which the equipment or its parts need to be thoroughly examined/tested.
- 15 (a) The condition of the equipment.
(b) The environment in which it is used.
(c) The duty cycle.
(d) Any changes, given by the employer, in the use of the equipment which could affect the scheme since the last examination.
- 16 It does not need to be in the form of a document so long as:
 - it is capable of being reproduced as a written copy when required;
 - it is secure from loss or unauthorised modification;
 - it is authenticated by the competent person who prepared the scheme.

Regulation 10: Self-assessment questions

- 1 (a) The competent person must notify the employer 'forthwith' of any defect in the equipment which could become a danger;
(b) 'As soon as practicable' the competent person must make a report of the examination to the employer and anyone from whom the equipment is leased or hired. Where there is a defect that is an existing or imminent risk of serious personal injury, he or she must send a copy of the report to the enforcing authority.
- 2 The employer must ensure that the lifting equipment is not used before the defect is rectified or not used after a time which is specified in the report.
- 3 The Health and Safety Executive.

Regulation 11: Self-assessment questions

- 1 For as long as the employer operates the equipment.
- 2 (a) Until the employer stops using the equipment.
(b) For two years after the report is made.
(c) Until the employer stops using the equipment at the place it was installed or assembled.
(d) Until the next report is made or for two years, whichever is later.

Further information

References

- 1 *Five steps to risk assessment* INDG163(rev2) HSE Books 2006 (single copy free or priced packs of 10 ISBN 978 0 7176 6189 3)
www.hse.gov.uk/pubns/indg163.pdf
- 2 *Code of practice for safe use of cranes* BS 7121:1989
- 3 *Avoidance of danger from overhead electric power lines* GS6 (Third edition) HSE Books 1997 ISBN 978 0 7176 1348 9

Other useful publications

Safe use of lifting equipment. Lifting Operations and Lifting Equipment Regulations 1998. Approved Code of Practice and guidance L113 HSE Books 1998
ISBN 978 0 7176 1628 2

Safe use of work equipment. Provision and Use of Work Equipment Regulations 1998. Approved Code of Practice and guidance L22 (Third edition) HSE Books 2008 ISBN 978 0 7176 6295 1

Management of health and safety at work. Management of Health and Safety at Work Regulations 1992. Approved Code of Practice and guidance L21 (Second edition) HSE Books 2000 ISBN 978 0 7176 2488 1

Safety in working with lift trucks HSG6 (Third edition) HSE Books 2000
ISBN 978 0 7176 1781 4

Hydrogen cracking of grade T(8) chain and components PM39 (Second edition) HSE Books 1998 ISBN 978 0 7176 1530 8

Control of substances hazardous to health (Fifth edition). The Control of Substances Hazardous to Health Regulations 2002 (as amended). Approved Code of Practice and guidance L5 (Fifth edition) HSE Books 2005
ISBN 978 0 7176 2981 7

Noise at Work: Guidance for employers on the Control of Noise at Work Regulations 2005 INDG362(rev1) HSE Books 2005 (single copy free or priced packs of 10 ISBN 978 0 7176 6165 7 www.hse.gov.uk/pubns/indg362.pdf)

Health and safety in tyre and exhaust fitting premises HSG62 HSE Books 1991
ISBN 978 0 7176 1686 2

Safety in the use of pallets PM15 (Third edition) HSE Books 1998
ISBN 978 0 7176 1522 3

Code of practice for hand signalling for use in agricultural operations BS 6736:1986

Safety in docks. Docks Regulations 1988. Approved Code of Practice and Guidance COP25 HSE Books 1988 ISBN 978 0 7176 1408 0

Shafts and winding in mines. Approved Code of Practice on the Mines (Shafts and Winding) Regulations 1993 L42 HSE Books 1993 ISBN 978 0 11 882164 3

*Manual handling. Manual Handling Operations Regulations 1992 (as amended).
Guidance on Regulations L23 (Third edition) HSE Books 2004
ISBN 978 0 7176 2823 0*

*Workplace health, safety and welfare. Workplace (Health, Safety and Welfare)
Regulations 1992. Approved Code of Practice and Guidance L24 HSE Books 1992
ISBN 978 0 7176 0413 5*

*Personal protective equipment at work (Second edition). Personal Protective
Equipment at Work Regulations 1992 (as amended). Guidance on Regulations L25
(Second edition) HSE Books 2005 ISBN 978 0 7176 6139 8*

*Safety signs and signals. Health and Safety (Safety Signs and Signals) Regulations
1996. Guidance on Regulations L64 HSE Books 1997 ISBN 978 0 7176 0870 6*

Further information

HSE priced and free publications can be viewed online or ordered from www.hse.gov.uk or contact HSE Books, PO Box 1999, Sudbury, Suffolk CO10 2WA Tel: 01787 881165 Fax: 01787 313995. HSE priced publications are also available from bookshops.

For information about health and safety ring HSE's Infoline Tel: 0845 345 0055 Fax: 0845 408 9566 Textphone: 0845 408 9577 e-mail: hse.infoline@natbrit.com or write to HSE Information Services, Caerphilly Business Park, Caerphilly CF83 3GG.

The Stationery Office

The Stationery Office publications are available from The Stationery Office, PO Box 29, Norwich NR3 1GN Tel: 0870 600 5522 Fax: 0870 600 5533 e-mail: customer.services@tso.co.uk Website: www.tso.co.uk (They are also available from bookshops.) Statutory Instruments can be viewed free of charge at www.opsi.gov.uk.

British Standards

British Standards can be obtained in PDF or hard copy formats from the BSI online shop: www.bsigroup.com/Shop or by contacting BSI Customer Services for hard copies only Tel: 020 8996 9001 e-mail: cservices@bsigroup.com.