

CONFORMS TO
IEE WIRING REGULATIONS
BS 7671:2001 (INCORPORATING
AMENDMENTS 1:2002 & 2:2004)

ADVANCED

ELECTRICAL INSTALLATION WORK

TREVOR LINSLEY

Matched to the requirements of the 2330 Level 3 Certificate in
Electrotechnical Technology from City & Guilds - Installation Route

FOURTH EDITION



Advanced Electrical Installation Work

Fourth Edition

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An imprint of Elsevier
Linacre House, Jordan Hill, Oxford OX2 8DP
30 Corporate Drive, Burlington, MA 01803

First published by Arnold 1998
Reprinted by Butterworth-Heinemann 2001, 2002, 2003 (twice), 2004 (twice)
Fourth edition 2005

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British Library Cataloguing in Publication Data

A catalogue record for this book is available from the British Library

For information on all Newnes publications
visit our web site at www.newnespress.com

ISBN 0 7506 6626 9

Typeset by Charon Tec Pvt. Ltd, Chennai, India
www.charontec.com
Printed and bound in Great Britain

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PREFACE

The fourth edition of *Advanced Electrical Installation Work* has been written as a complete textbook for the City and Guilds 2330 Level 3 Certificate in Electrotechnical Technology and the City and Guilds 2356 Level 3 NVQ in Installing Electrotechnical Systems. The book meets the combined requirements of these courses, that is the core units and the electrical installation occupational units and therefore students need purchase only this one textbook for all subjects in the Level 3 examinations.

The book will also assist students taking the SCOTVEC and BTEC Electrical and Utilization units at levels II and III and many taking engineering NVQ and Modern Apprenticeship courses.

Although the text is based upon the City and Guilds syllabus, the book also provides a sound basic knowledge and comprehensive guide for other professionals in the construction and electrotechnical industries.

Modern regulations place a greater responsibility upon the installing electrician for safety and the design of an installation. The latest regulations governing electrical installations are the 16th edition of the IEE Wiring Regulations (BS 7671: 2001). The fourth edition of this book has been revised and updated to incorporate the requirements and amendments of the 16th edition of the IEE Wiring Regulations BS7671:2001.

The City and Guilds examinations comprise assignments and multiple-choice papers. For this reason multiple-choice questions can be found at the end of each chapter. More traditional questions are included as an aid to private study and to encourage a thorough knowledge of the subject.

I would like to acknowledge the assistance given by the following manufacturers and organizations in the preparation of this book:

Crabtree Electrical Industries Limited
Wylex Ltd
RS Components Ltd
The Institution of Electrical Engineers
The British Standards Institution
The City & Guilds of London Institute

I would also like to thank my colleagues and students at Blackpool and The Fylde College for their suggestions and assistance during the preparation of this book.

Finally, I would like to thank Joyce, Samantha and Victoria for their support and encouragement.

Trevor Linsley

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HEALTH AND SAFETY AND ELECTRICAL PRINCIPLES

Introduction

This first chapter of Advanced Electrical Installation work covers all of the core skills required by the City & Guilds Level 3 Certificate in Electrotechnical Technology. That is the Health and Safety Laws and Regulations and the electrical science that underpins the electrotechnical industry.

HEALTH AND SAFETY AT WORK

Let me begin by looking at the background to the modern Health and Safety Regulations and the electricity supply and wiring regulations.

Electricity generation as we know it today began when Michael Faraday conducted the famous ring experiment in 1831. This experiment, together with many other experiments of the time, made it possible for Lord Kelvin and Sebastian de Ferranti to patent in 1882 the designs for an electrical machine called the Ferranti-Thompson dynamo, which enabled the generation of electricity on a commercial scale.

In 1887 the London Electric Supply Corporation was formed with Ferranti as chief engineer. This was one of many privately owned electricity generating stations supplying the electrical needs of the UK. As the demand for electricity grew, more privately owned generating stations were built until eventually the government realized that electricity was a national asset which would benefit from nationalization.

In 1926 the Electricity Supply Act placed the responsibility for generation in the hands of the Central Electricity Board. In England and Wales the Central Electricity Generating Board (CEGB) had the responsibility for the generation and transmission of electricity on the Supergrid. In Scotland, generation was the joint responsibility of the North of Scotland Hydro-Electricity Board and the South of Scotland Electricity Board. In Northern Ireland electricity generation was the responsibility of the Northern Ireland Electricity Service.

In 1988 Cecil Parkinson, the Secretary of State for Energy in the Conservative government, proposed the denationalization of the electricity supply industry; this became law in March 1991, thereby returning the responsibility for generation, transmission and distribution to the private sector. It was anticipated that this action, together with new legislation over the security of supplies, would lead to a guaranteed quality of provision, with increased competition leading eventually to cheaper electricity.

During the period of development of the electricity services, particularly in the early days, poor design and installation led to many buildings being damaged by fire and the electrocution of human beings and livestock. It was the insurance companies which originally drew up a set of rules and guidelines of good practice in the interest of reducing the number of claims made upon them. The first rules were made by the American Board of Fire Underwriters and were quickly followed by the Phoenix Rules of 1882. In the same year the first edition of the Rules and Regulations

for the Prevention of Fire Risk arising from Electrical Lighting was issued by the Institute of Electrical Engineers.

The current edition of these regulations is called the Requirements for Electrical Installations, IEE Wiring Regulations (BS 7671:2001), and since January 1993 we have been using the 16th edition. All the rules have been revised, updated and amended at regular intervals to take account of modern developments, and the 16th edition brought the UK Regulations into harmony with those of the rest of Europe.

The laws and regulations affecting the electrotechnical industry have steadily increased over the years. A further huge amount of legislation from the European law-makers in Brussels reached the UK in January 2005. These laws and regulations will permeate each and every sector of the electrotechnical industry and reform and modify our future work patterns and behaviour.

In this section I want to deal with the laws and regulations that affect our industry under three general headings because there are a large number of them, and it may help us to appreciate the reasons for them. First of all I want to look at the laws concerned with health and safety at work, making the working environment safe. Then I want to go on to the laws that protect our environment from, for example, industrial waste and pollution and finally, I will look at employment legislation and the laws which protect us as individual workers, people and citizens.

The Health and Safety at Work Act 1974

Many governments have passed laws aimed at improving safety at work but the most important recent legislation has been the Health and Safety at Work Act 1974. The purpose of the Act is to provide the legal framework for stimulating and encouraging high standards of health and safety at work; the Act puts the responsibility for safety at work on both workers and managers.

The Health and Safety at Work Act is an 'Enabling Act' that allows the Secretary of State to make further laws, known as regulations, without the need to pass another Act of Parliament. Regulations are law, passed by Parliament and are usually made under the Health

and Safety at Work Act 1974. This applies to regulations based on European directives as well as new UK regulations. The way it works is that the Health and Safety at Work Act established the Health and Safety Commission (HSC) and gave it the responsibility of drafting new regulations and enforcing them through its executive arm known as the Health and Safety Executive (HSE) or through the local Environmental Health Officers (EHO). The Health and Safety Commission has equal representation from employers, trade unions and special interest groups. Their role is to set out the regulations as goals to be achieved. They describe what must be achieved in the interests of safety, but not how it must be done.

Under the Health and Safety at Work Act an employer has a duty to care for the health and safety of employees (Section 2 of the Act). To do this he must ensure that:

- the working conditions and standard of hygiene are appropriate;
- the plant, tools and equipment are properly maintained;
- the necessary safety equipment – such as personal protective equipment, dust and fume extractors and machine guards – are available and properly used;
- the workers are trained to use equipment and plant safely.

Employees have a duty to care for their own health and safety and that of others who may be affected by their actions (Section 7 of the Act). To do this they must:

- take reasonable care to avoid injury to themselves or others as a result of their work activity;
- co-operate with their employer, helping him or her to comply with the requirements of the Act;
- not interfere with or misuse anything provided to protect their health and safety.

Failure to comply with the Health and Safety at Work Act is a criminal offence and any infringement of the law can result in heavy fines, a prison sentence or both.

ENFORCEMENT

Laws and rules must be enforced if they are to be effective. The system of control under the Health and Safety at Work Act comes from the HSE which is charged with

enforcing the law. The HSE is divided into a number of specialist inspectorates or sections which operate from local offices throughout the UK. From the local offices the inspectors visit individual places of work.

The HSE inspectors have been given wide-ranging powers to assist them in the enforcement of the law. They can:

- 1 enter premises unannounced and carry out investigations, take measurements or photographs;
- 2 take statements from individuals;
- 3 check the records and documents required by legislation;
- 4 give information and advice to an employee or employer about safety in the workplace;
- 5 demand the dismantling or destruction of any equipment, material or substance likely to cause immediate serious injury;
- 6 issue an improvement notice which will require an employer to put right, within a specified period of time, a minor infringement of the legislation;
- 7 issue a prohibition notice which will require an employer to stop immediately any activity likely to result in serious injury, and which will be enforced until the situation is corrected;
- 8 prosecute all persons who fail to comply with their safety duties, including employers, employees, designers, manufacturers, suppliers and the self-employed.

SAFETY DOCUMENTATION

Under the Health and Safety at Work Act, the employer is responsible for ensuring that adequate instruction and information is given to employees to make them safety-conscious. Part 1, section 3 of the Act instructs all employers to prepare a written health and safety policy statement and to bring this to the notice of all employees. Your employer must let you know who your safety representatives are and the new health and safety poster shown in Fig. 1.1 has a blank section into which the names and contact information of your specific representatives can be added. This is a large laminated poster, 595 × 415 mm suitable for wall or notice board display.

All workplaces employing five or more people must display the type of poster shown in Fig. 1.1 after 30th June 2000.

To promote adequate health and safety measures the employer must consult with the employees' safety

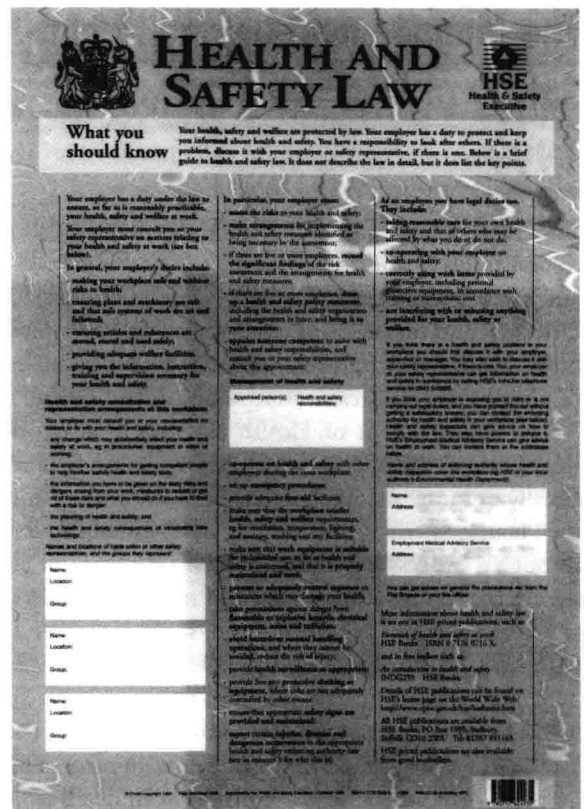


Fig. 1.1 New Health and Safety Law poster. Source: HSE © Crown copyright material is reproduced with the permission of the Controller of HMSO and Her Majesty's Stationery Office, Norwich.

representatives. In companies which employ more than 20 people this is normally undertaken by forming a safety committee which is made up of a safety officer and employee representatives, usually nominated by a trade union. The safety officer is usually employed full-time in that role. Small companies might employ a safety supervisor, who will have other duties within the company, or alternatively they could join a 'safety group'. The safety group then shares the cost of employing a safety adviser or safety officer, who visits each company in rotation. An employee who identifies a dangerous situation should initially report to his site safety representative. The safety representative should then bring the dangerous situation to the notice of the safety committee for action which will remove the danger. This may mean changing company policy or procedures or making modifications to equipment. All actions of the safety committee should be documented and recorded as evidence that the company takes seriously its health and safety policy.

The Management of Health and Safety at Work Regulations 1999

The Health and Safety at Work Act 1974 places responsibilities on employers to have robust health and safety systems and procedures in the workplace. Directors and managers of any company who employ more than five employees can be held personally responsible for failures to control health and safety.

The Management of Health and Safety at Work Regulations 1999 tell us that employers must systematically examine the workplace, the work activity and the management of safety in the establishment through a process of 'risk assessments'. A record of all significant risk assessment findings must be kept in a safe place and be available to an HSE inspector if required. Information based on these findings must be communicated to relevant staff and if changes in work behaviour patterns are recommended in the interests of safety, then they must be put in place. The process of risk assessment is considered in detail later in this chapter.

Risks, which may require a formal assessment in the electrotechnical industry, might be:

- working at heights;
- using electrical power tools;
- falling objects;
- working in confined places;
- electrocution and personal injury;
- working with 'live' equipment;
- using hire equipment;
- manual handling: pushing, pulling, lifting;
- site conditions: falling objects, dust, weather, water, accidents and injuries.

And any other risks which are particular to a specific type of work place or work activity.

Provision and Use of Work Equipment Regulations 1998

These regulations tidy up a number of existing requirements already in place under other regulations

such as the Health and Safety at Work Act 1974, the Factories Act 1961 and the Offices, Shops and Railway Premises Act 1963.

The Provision and Use of Work Equipment Regulations 1998 places a general duty on employers to ensure minimum requirements of plant and equipment. If an employer has purchased good quality plant and equipment, which is well maintained, there is little else to do. Some older equipment may require modifications to bring it in line with modern standards of dust extraction, fume extraction or noise, but no assessments are required by the regulations other than those generally required by the Management Regulations 1999 discussed previously.

The Control of Substances Hazardous to Health Regulations 1988

The original COSHH Regulations were published in 1988 and came into force in October 1989. They were re-enacted in 1994 with modifications and improvements, and the latest modifications and additions came into force in 2002.

The COSHH Regulations control people's exposure to hazardous substances in the workplace. Regulation 6 requires employers to assess the risks to health from working with hazardous substances, to train employees in techniques which will reduce the risk and provide personal protective equipment (PPE) so that employees will not endanger themselves or others through exposure to hazardous substances. Employees should also know what cleaning, storage and disposal procedures are required and what emergency procedures to follow. The necessary information must be available to anyone using hazardous substances as well as to visiting HSE inspectors.

Hazardous substances include:

- 1 any substance which gives off fumes causing headaches or respiratory irritation;
- 2 man-made fibres which might cause skin or eye irritation (e.g. loft insulation);
- 3 acids causing skin burns and breathing irritation (e.g. car batteries, which contain dilute sulphuric acid);

- 4 solvents causing skin and respiratory irritation (strong solvents are used to cement together PVC conduit fittings and tube);
- 5 fumes and gases causing asphyxiation (burning PVC gives off toxic fumes);
- 6 cement and wood dust causing breathing problems and eye irritation;
- 7 exposure to asbestos – although the supply and use of the most hazardous asbestos material is now prohibited, huge amounts were installed between 1950 and 1980 in the construction industry and much of it is still in place today. In their latest amendments the COSHH Regulations focus on giving advice and guidance to builders and contractors on the safe use and control of asbestos products. These can be found in Guidance Notes EH 71.

Where personal protective equipment is provided by an employer, employees have a duty to use it to safeguard themselves.

Personal Protective Equipment (PPE) at Work Regulations 1992

PPE is defined as all equipment designed to be worn, or held, to protect against a risk to health and safety.

This includes most types of protective clothing, and equipment such as eye, foot and head protection, safety harnesses, life jackets and high-visibility clothing.

Under the Health and Safety at Work Act, employers must provide free of charge any personal protective equipment and employees must make full and proper use of it. Safety signs such as those shown at Fig. 1.2 are useful reminders of the type of PPE to be used in a particular area. The vulnerable parts of the body which may need protection are the head, eyes, ears, lungs, torso, hands and feet and, additionally, protection from falls may need to be considered. Objects falling from a height present the major hazard against which head protection is provided. Other hazards include striking the head against projections and hair becoming entangled in machinery. Typical methods of protection include helmets, light duty scalp protectors called 'bump caps' and hairnets.

The eyes are very vulnerable to liquid splashes, flying particles and light emissions such as ultraviolet light, electric arcs and lasers. Types of eye protectors include safety spectacles, safety goggles and face shields. Screen based workstations are being used increasingly in industrial and commercial locations by all types of personnel. Working with VDUs (visual display units) can cause eye strain and fatigue and, therefore, this hazard is the subject of a separate section later in this chapter headed VDU operation hazards.



Fig. 1.2 Safety signs showing type of PPE to be worn.

Noise is accepted as a problem in most industries and surprisingly there has been very little control legislation. The Health and Safety Executive have published a 'Code of Practice' and 'Guidance Notes' HSG 56 for reducing the exposure of employed persons to noise. A continuous exposure limit of below 90 dB for an 8-hour working day is recommended by the code.

Noise may be defined as any disagreeable or undesirable sound or sounds, generally of a random nature, which do not have clearly defined frequencies. The usual basis for measuring noise or sound level is the decibel scale. Whether noise of a particular level is harmful or not also depends upon the length of exposure to it. This is the basis of the widely accepted limit of 90 dB of continuous exposure to noise for 8 hours per day.

A peak sound pressure of above 200 pascals or about 120 dB is considered unacceptable and 130 dB is the threshold of pain for humans. If a person has to shout to be understood at, 2 m the background noise is about 85 dB. If the distance is only 1 m, the noise level is about 90 dB. Continuous noise at work causes deafness, makes people irritable, affects concentration, causes fatigue and accident proneness and may mask sounds which need to be heard in order to work efficiently and safely.

It may be possible to engineer out some of the noise, for example, by placing a generator in a separate sound-proofed building. Alternatively, it may be possible to provide job rotation, to rearrange work locations or provide acoustic refuges.

Where individuals must be subjected to some noise at work it may be reduced by ear protectors. These may be disposable ear plugs, re-usable ear plugs or ear muffs. The chosen ear protector must be suited to the user and suitable for the type of noise and individual personnel should be trained in its correct use.

Breathing reasonably clean air is the right of every individual, particularly at work. Some industrial processes produce dust which may present a potentially serious hazard. The lung disease asbestosis is caused by the inhalation of asbestos dust or particles and the coal dust disease pneumoconiosis, suffered by many coal miners, has made people aware of the dangers of breathing in contaminated air.

Some people may prove to be allergic to quite innocent products such as flour dust in the food industry or wood dust in the construction industry. The main

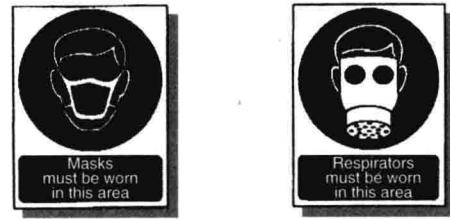


Fig. 1.3 Breathing protection signs.

effect of inhaling dust is a measurable impairment of lung function. This can be avoided by wearing an appropriate mask, respirator or breathing apparatus as recommended by the company's health and safety policy and indicated by local safety signs such as those shown in Fig. 1.3.

A worker's body may need protection against heat or cold, bad weather, chemical or metal splash, impact or penetration and contaminated dust. Alternatively, there may be a risk of the worker's own clothes causing contamination of the product, as in the food industry. Appropriate clothing will be recommended in the company's health and safety policy. Ordinary working clothes and clothing provided for food hygiene purposes are not included in the Personal Protective Equipment at Work Regulations. Figure 1.4 shows typical safety signs to be found in the food industry.

Hands and feet may need protection from abrasion, temperature extremes, cuts and punctures, impact or skin infection. Gloves or gauntlets provide protection from most industrial processes but should not be worn when operating machinery because they may become entangled in it. Care in selecting the appropriate protective device is required; for example, barrier creams provide only a limited protection against infection.

Boots or shoes with in-built toe caps can give protection against impact or falling objects and, when fitted with a mild steel sole plate, can also provide protection from sharp objects penetrating through the sole. Special slip resistant soles can also be provided for employees working in wet areas.

Whatever the hazard to health and safety at work, the employer must be able to demonstrate that he or she has carried out a risk analysis, made recommendations which will reduce that risk and communicated these recommendations to the workforce. Where there is a need for PPE to protect against personal injury and to



Fig. 1.4 PPE and safety signs to be found in the food industry.

create a safe working environment, the employer must provide that equipment and any necessary training which might be required and the employee must make full and proper use of such equipment and training.

RIDDOR

RIDDOR stands for Reporting of Injuries, Diseases and Dangerous Occurrences Regulation 1995, which is sometimes referred to as RIDDOR 95, or just RIDDOR for short. The HSE requires employers to report some work related accidents or diseases so that they can identify where and how risks arise, investigate serious accidents and publish statistics and data to help reduce accidents at work.

What needs reporting? Every work related death, major injury, dangerous occurrence, disease or any injury which results in an absence from work of over 3 days.

Where an employee or member of the public is killed as a result of an accident at work the employer or his representative must report the accident to the Environmental Health Department of the local authority by telephone that day and give brief details. Within 10 days this must be followed up by a complete accident report form (Form No. F2508). Major injuries sustained as a result of an accident at work include amputations, loss of sight (temporary or permanent), fractures to the body other than to fingers, thumbs or toes and any other serious injury. Once again, the Environmental Health Department of the local authority must be notified by telephone on the day that the serious injury occurs and the telephone call followed up by a completed Form F2508 within 10 days. Dangerous occurrences are listed in the regulations and include the collapse of a lift, an explosion

or injury caused by an explosion, the collapse of a scaffold over five metres high, the collision of a train with any vehicle, the unintended collapse of a building and the failure of fairground equipment.

Depending upon the seriousness of the event, it may be necessary to immediately report the incident to the local authority. However, the incident must be reported within 10 days by completing Form F2508. If a doctor notifies an employer that an employee is suffering from a work related disease then form F2508A must be completed and sent to the local authority. Reportable diseases include certain poisonings, skin diseases, lung disease, infections and occupational cancer. The full list is given within the pad of report forms.

An accident at work resulting in an over 3 day injury, that is, an employee being absent from work for over three days as a result of an accident at work, requires that accident report form F2508 be sent to the local authority within 10 days.

An over 3 day injury is one which is not major but results in the injured person being away from work for more than 3 days not including the day the injury occurred.

Who are the reports sent to? They are sent to the Environmental Health Department of the local authority or the area HSE offices (See the Appendix L of this book for area office addresses). Accident report forms F2508 can also be obtained from them or by ringing the HSE Infoline or by ringing the Incident contact centre on telephone number 0845 300 9923.

For most businesses, a reportable accident, dangerous occurrence or disease is a very rare event. However, if a report is made, the company must keep a record of the occurrence for 3 years after the date on which the incident happened. The easiest way to do this would probably be to file a photocopy of the completed accident report form F2508, but a record may be kept in any form which is convenient.

The Control of Major Accidents and Hazards (COMAH) Regulations 1999

The COMAH Regulations came into force on the 1st April 1999. Their main aim is to prevent any major accidents involving dangerous substances such as chlorine, liquefied petroleum gas (LPG), explosives and arsenic pentoxide that would cause serious harm to people or damage the environment. The COMAH Regulations regard risks to the environment just as seriously as harm to people.

These regulations apply mainly to the chemical industry but also apply to some storage facilities and nuclear sites.

Operators who fall within the scope of these regulations must 'take all measures necessary to prevent major accidents and limit their consequences to people and the environment'. This sets high standards of control but by requiring operators to put in place measures for both prevention and mitigation, which means to make less serious, there is the recognition that all risks cannot be completely eliminated. Operators must, therefore, be able to show that they have taken 'all measures necessary' to prevent an accident occurring.

The COMAH Regulations are enforced by the Health and Safety Executive (HSE) and the Environment Agency.

Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR)

The DSEAR Regulations came into force on the 9th December 2002 and complement the Management of Health and Safety at Work Regulations 1999. They are designed to implement the safety requirements of the Chemical Agents and Explosive Atmospheres Directive.

DSEAR deals with any dangerous substance that has the potential to create a risk to persons from energetic or energy releasing events such as fires or explosions. Dangerous substances include petrol, liquefied petroleum gas (LPG), paint, solvents and combustible

or explosive dust produced in machining and sanding operations, flour mills and distilleries.

Many of these substances will also create a health risk, for example, solvents are toxic as well as being flammable. However, DSEAR does not address the health risk, only the fire and explosion risk. The potential health risk is dealt with under the COSHH Regulations discussed earlier in this Chapter.

The DSEAR Regulations follow the modern risk assessment based approach. Technical and organizational measures are required to eliminate or reduce risks as far as is reasonably practicable. There is a requirement to provide equipment and procedures to deal with accidents and emergencies and also to provide information and training for employees.

So what sort of industries does DSEAR apply to? DSEAR is concerned with the harmful effects from burns, pressure injuries from explosions and asphyxiation arising from fires and explosions. Typical industries might be those concerned with the storage of petrol as a fuel for vehicles, agricultural and horticultural storage and the movement of bulk powders for the food industry, the storing of waste dust in a range of manufacturing industries, dust produced in the mining of coal, storage and transportation of paint and LPG.

The Construction (Design and Management) Regulations 1994 (CDM)

The CDM Regulations are aimed at improving the overall management of health, safety and welfare throughout all stages of the construction project.

The person requesting that construction work commence, the client, must first of all appoint a 'duty holder', someone who has a duty of care for health, safety and welfare matters on site. This person will be called a 'planning supervisor'. The planning supervisor must produce a 'pre-tender' health and safety plan and co-ordinate and manage this plan during the early stages of construction.

The client must also appoint a principal contractor who is then required to develop the health and safety plan made by the planning supervisor, and keep it up to date during the construction process to completion.

The degree of detail in the health and safety plan should be in proportion to the size of the construction project and recognize the health and safety risks involved on that particular project. Small projects will require simple straightforward plans, large projects, or those involving significant risk, will require more detail. The CDM Regulations will apply to most large construction projects but they do not apply to the following:

- Construction work, other than demolition work, that does not last longer than 30 days and does not involve more than four people.
- Construction work carried out inside commercial buildings such as shops and offices, which does not interrupt the normal activities carried out on those premises.
- Construction work carried out for a domestic client.
- The maintenance and removal of pipes or lagging which forms a part of a heating or water system within the building.

The Construction (Health, Safety and Welfare) Regulations 1996

An electrical contractor is a part of the construction team, usually as a subcontractor, and therefore the regulations particularly aimed at the construction industry also influence the daily work procedures and environment of an electrician. The most important recent piece of legislation are the Construction Regulations.

The temporary nature of construction sites makes them one of the most dangerous places to work. These regulations are made under the Health and Safety at Work Act 1974 and are designed specifically to promote safety at work in the construction industry. Construction work is defined as any building or civil engineering work, including construction, assembly, alterations, conversions, repairs, upkeep, maintenance or dismantling of a structure.

The general provision sets out minimum standards to promote a good level of safety on site. Schedules specify the requirements for guardrails, working platforms, ladders, emergency procedures, lighting and welfare facilities. Welfare facilities set out minimum provisions for site accommodation: washing facilities, sanitary conveniences and protective clothing. There

is now a duty for all those working on construction sites to wear head protection, and this includes electricians working on site as subcontractors.

Building Regulations – Part P 2005

The Building Regulations lay down the design and build standards for construction work in buildings in a series of Approved Documents. The scope of each Approved Document is given below:

- Part A structure
- Part B fire safety
- Part C site preparation and resistance to moisture
- Part D toxic substances
- Part E resistance to the passage of sound
- Part F ventilation
- Part G hygiene
- Part H drainage and waste disposal
- Part J combustion appliances and fuel storage systems
- Part K protection from falling, collision and impact.
- Part L conservation of fuel and power
- Part M access and facilities for disabled people
- Part N glazing – safety in relation to impact, opening and cleaning
- Part P electrical safety

Part P of the Building Regulations was published on the 22nd July 2004, bringing domestic electrical installations in England and Wales under building regulations control. This means that anyone carrying out domestic electrical installation work from 1st January 2005 must comply with Part P of the Building Regulations.

If the electrical installation meets the requirements of the IEE Regulations BS 7671, then it will also meet the requirements of Part P of the Building Regulations, so no change there. What is going to change under Part P is this new concept of 'notification' to carry out electrical work.

NOTIFIABLE ELECTRICAL WORK

Any work to be undertaken by a firm or individual who is *not* registered under an 'approved competent

person scheme' must be notified to the Local Authority Building Control Body before work commences. That is, work that involves:

- the provision of at least one new circuit,
- work carried out in kitchens,
- work carried out in bathrooms,
- work carried out in special locations such as swimming pools and hot air saunas.

Upon completion of the work, the Local Authority Building Control Body will test and inspect the electrical work for compliance with Part P of the Building Regulations.

NON-NOTIFIABLE ELECTRICAL WORK

Work carried out by a person or firm registered under an authorized Competent Persons Self-Certification Scheme or electrical installation work that does not include the provision of a new circuit. This includes work such as:

- replacing accessories such as socket outlets, control switches and ceiling roses;
- replacing a like for like cable for a single circuit which has become damaged by, for example, impact, fire or rodent;
- re-fixing or replacing the enclosure of an existing installation component providing the circuits protective measures are unaffected;
- providing mechanical protection to existing fixed installations;
- adding lighting points (light fittings and switches) to an existing circuit, provided that the work is not in a kitchen, bathroom or special location;
- installing or upgrading the main or supplementary equipotential bonding provided that the work is not in a kitchen, bathroom or special location.

All replacement work is non-notifiable even when carried out in kitchens, bathrooms and special locations, but certain work carried out in kitchens, bathrooms and special locations may be notifiable, even when carried out by an authorized competent person. The IEE propose to publish a guide early in 2005 called the *Electricians Guide* to the Building Regulations which will bring clarity to this subject. In specific cases the Local Authority Building Control Officer or an approved Inspector will be able to confirm whether Building Regulations apply.

Failure to comply with the Building Regulations is a criminal offence and Local Authorities have the power to require the removal or alteration of work that does not comply with these requirements.

Electrical work carried out by DIY home-owners will still be permitted after the introduction of Part P. Those carrying out notifiable DIY work must first submit a building notice to the Local Authority before the work begins. The work must then be carried out to the standards set by the IEE Wiring Regulations BS 7671 and a building control fee paid for such work to be inspected and tested by the Local Authority.

COMPETENT PERSONS SCHEME

The Competent Persons Self-Certification Scheme is aimed at those who carry out electrical installation work as the primary activity of their business. The Government has approved schemes to be operated by BRE Certification Ltd., British Standards Institution, ELECSA Ltd., NICEIC Certification Services Ltd., and Napit Certification Services Ltd. All the different bodies will operate the scheme to the same criteria and will be monitored by the Office of the Deputy Prime Minister.

Those individuals or firms wishing to join the Competent Persons Scheme will need to demonstrate their competence, if necessary, by first undergoing training. The work of members will then be inspected at least once each year. There will be an initial registration and assessment fee and then an annual membership and inspection fee.

The Electricity Safety, Quality and Continuity Regulations 2002

The Electricity Safety, Quality and Continuity Regulations replaces the Electricity Supply Regulations 1988. They are statutory regulations which are enforceable by the laws of the land. They are designed to ensure a proper and safe supply of electrical energy up to the consumer's terminals.

These regulations impose requirements upon the regional electricity companies regarding the installation and use of electric lines and equipment. The regulations are administered by the Engineering