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All HSE Inspectors

THE ELECTRICITY AT WORK REGULATIONS 1989

INTRODUCTION AND CONTENTS

1 The Electricity at Work Regulations 1989 (EAW Regulations) came into force on 1 April 1990. This OC aims to highlight the key issues on inspection and enforcement for inspectors. It is not comprehensive. The contents are as follows:

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2 Practical guidance on the Regulations is given in the *Memorandum of guidance on the Electricity at Work Regulations 1989* (HS(R)25 - file 480) which should be read in conjunction with this OC.

3 Quarries inspectors should refer to *The use of electricity at quarries* ACoP (file 480).

GENERAL

4 (1) The majority of the Regulations are directed at *hardware* requirements. Installations are required to be of proper construction; conductors must be insulated or other precautions taken; there must be means of cutting off the power and means for electrical isolation. The hardware requirements are complemented by a group of Regulations stating principles of safe working practice. Regulation 14, which covers live working, is of particular importance.

(2) The scope of the EAW Regulations is limited by the definition of *danger* and *injury* solely to risks arising from an electrical source and does not include, for example, control-system faults and consequent hazards such as aberrant machinery behaviour.

(3) The EAW Regulations revoke a number of specific Regulations, but a number remain which either overlap or appear to overlap, for example:

(a) the Electricity Supply Regulations 1988 (as amended): see the introduction to the *Memorandum of guidance* and FOD Code IN Ma;

(b) the Low Voltage Electrical Equipment (Safety) Regulations 1988 (made under the Consumer Protection Act 1987): see FIC 481/4 (revised), AIC 1989/14;

(c) the Building Standards (Scotland) Regulations 1981: these give *deemed-to-satisfy* status to the Institution of Electrical Engineers Wiring Regulations; and

(d) the Cinematographic (Safety) Regulations, 1955.

If demarcation between these sets of Regulations and the EAW Regulations is unclear in a particular case, then details should be passed to CI 4.

(4) Appendices 1 and 2 of the *Memorandum of guidance* list publications relating to electrical safety.

ENFORCEMENT

5 (1) There is no expectation that inspectors should change their general approach to enforcement. However, particular attention should be paid to the enforcement of reg.14.

(2) In situations where the 1908 Regulations previously applied or where HSW Act was used, inspectors should now enforce the EAW Regulations.

(3) There should be no difference in enforcement between situations in which no specific regulations previously applied and those which were regulated.

(4) Nothing is required by the EAW Regulations which is not already the norm in the best undertakings.

(5) The EAW Regulations will apply to electrical work in domestic premises. Advice to inspectors is given in the appendix.

(6) FCG assistance to prove the presence of electricity should not be necessary when contemplating enforcement action. Circumstantial evidence should suffice to indicate that electricity is present and that the EAW Regulations apply. Such evidence could include:

- (a) that the equipment carried a plate indicating that it worked at mains voltage;
- (b) that the equipment was connected to a supply via a 3-pin plug;
- (c) that the premises were supplied with electricity for lighting which was working; and
- (d) that a person on the premises paid an electricity bill.

In court, FCG inspectors may be able to use such evidence to express a professional opinion as to the dangers which are present or likely to occur.

(7) It may also be possible to use an on-site electrician to measure voltages and use his or her measurements in evidence.

(8) An improvement notice may be appropriate if conductors are inadequately protected against damage; for example, not routed through conduit, tubing or armouring. In particularly arduous conditions, eg construction, stronger action may be considered.

(9) Exposed and accessible live conductors or a lack of earthing could justify a prohibition notice. Lack of earthing can only be proved by measurement; simple observation is never adequate.

INTERPRETATION (REG.2)

6 (1) The definitions of *danger and injury* are linked but distinguished to accommodate those circumstances when persons must work on or so near live equipment that there is a

risk of injury, ie where danger is present and cannot be prevented.

(2) *Danger* includes danger to the public.

(3) The definition of *electrical equipment* excludes items which only generate electricity adventitiously, eg as static.

(4) *Earthing and isolation* are defined in regs.8 and 12 respectively.

DUTIES (REG.3)

7 (1) Regulation 3 imposes duties only on employers, employees, the self-employed, and mine or quarry managers. In other cases HSW Act ss.3 and 4 will apply.

(2) All duties are limited by the phrase "to matters which are within his control", apart from reg.3(2)(a) which is similar to HSW Act, s.7(b). Some large industries tend to produce written rules which clearly define the extent of an individual's control but it will often be the case that there is overlapping liability where several individuals and/or bodies corporate are duty holders.

SYSTEMS, WORK ACTIVITIES AND PROTECTIVE EQUIPMENT (REG.4)

8 (1) Regulation 4 acts as a *catch-all* requirement.

(2) Due to the broad definition of *system* (reg.2), reg.4 covers almost every conceivable electrical danger: from an exploding lithium battery in a calculator to the output side of a power station.

(3) Systems in vehicles are covered by reg.4, but note should be taken of reg.32 in relation to ships, aircraft and hovercraft.

(4) Regulation 4(3) embraces all work which could lead to electrical danger, although such work may not be associated with an electrical system. This would include work in the vicinity of electrical equipment and insulated or uninsulated conductors. The requirement does not limit proximity to conductors, live or dead, but rather regulates the work activity so as not to give rise to danger.

(5) Regulation 4(3) is almost always applicable to work on or near underground cables, in which situations the standards of the Construction (GP) Regulations, reg.44 should be maintained, viz electrical isolation by disconnection and secure separation from sources of electrical supply. However, reg.14 should be used if there has been a failure to switch off the supply to such cables before undertaking work. That said, the circumstances of each case will dictate which regulation should be used.

(6) The duties in reg.4(4) are not qualified by "so far as is reasonably practicable" and link with reg.14(c) ensuring that protective equipment provided is always suitable for the purpose.

STRENGTH AND CAPABILITY OF ELECTRICAL EQUIPMENT (REG.5)

9 (1) The assigned rating of electrical equipment represents the extent to which it has been tested under certain conditions. An assigned rating may be used in an assessment of the adequacy of equipment strength and capability in foreseeable conditions of actual use; but

may not necessarily represent all factors to be considered. A technical judgement by a competent person will often be needed to determine adequacy.

(2) If a failure has occurred, it may be relatively easy to prove a contravention. However, FCG support will be required except where a deficiency is obvious and requires no technical proof.

ADVERSE OR HAZARDOUS ENVIRONMENTS (REG.6)

10 (1) Regulation 6 addresses extrinsic effects which are reasonably foreseeable. For example, in order to prove a contravention of reg.6, it is not necessary to show that electrical equipment is or has been exposed to a flammable atmosphere, but only that it is foreseeable that it could be so exposed.

(2) The *Memorandum of guidance* gives general advice on the different hazardous environments covered by reg.6, and makes reference to relevant standards and publications.

INSULATION, PROTECTION AND PLACING OF CONDUCTORS (REG.7)

11 (1) This regulation is an example of where the EAW Regulations extend protection to anyone exposed to electrical danger from electrical equipment, including those not at work.

EARTHING AND OTHER SUITABLE PRECAUTIONS (REG.8)

12 (1) This regulation applies to any conductor and not just to metal. It also allows other suitable means of preventing danger as an alternative to earthing.

(2) The duty to prevent danger arising is activated only when a relevant conductor becomes charged.

(3) Regulation 4 requires that systems are constructed so as to prevent danger; but in the event that danger arises because a conductor which should be earthed is not, reg.8 also becomes relevant.

(4) As regards adequate earthing, the use of a conductor with a small cross-sectional area, which is not capable of carrying a heavy current for the duration of the fault, is not acceptable.

(5) Inspectors should continue to press for the use of reduced voltage lighting and power tools, eg 110V centre tapped to earth in the working environments in para 19 of the *Memorandum of guidance*.

INTEGRITY OF REFERENCE CONDUCTORS (REG.9)

13 (1) Regulation 9 is fully explained in the *Memorandum of guidance*.

CONNECTIONS (REG.10)

14 (1) The definition of *danger* means that connections have to be mechanically and electrically suitable to prevent the risk of electrical injury.

MEANS FOR PROTECTING FROM EXCESS CURRENT (REG.11)

15 (1) The *due-diligence* defence in reg.29 is important when enforcing this requirement because, in theory, it is impossible in an absolute sense to prevent danger arising before any excess current protection device operates.

MEANS OF CUTTING OFF THE SUPPLY AND FOR ISOLATION (REG.12)

16 (1) This regulation cannot be used to require means to prevent non-electrical hazards arising from the use of electrical controlled systems.

(2) Permit-to-work systems with an indication of danger may be encountered. Where such systems are well established, tried and tested they could represent adequate isolation. However, they need to meet the minimum requirements of this regulation and when assessing such systems, inspectors should seek the assistance of FCG, where appropriate.

(3) Regulation 12 covers electrical equipment which may become charged by means other than connection to the supply, eg through capacitance or induced current arising from proximity to other live conductors.

(4) There are no voltage limits.

PRECAUTIONS FOR WORK ON EQUIPMENT MADE DEAD (REG.13)

17 (1) Regulation 13 may apply during any work, be it electrical or non-electrical.

WORK ON OR NEAR LIVE CONDUCTORS (REG.14)

18 (1) This regulation is very important and should be used to reduce the incidence of live working and to ensure strict precautions are adhered to when such work is carried out.

(2) All 3 conditions stipulated in the regulation must be met before live working is permitted.

(3) "Reasonable in all the circumstances" (reg.14(b)) means that all necessary precautions must be taken to ensure it is reasonable for someone to be asked to work.

(4) Regulation 14(c) could imply that in the absence of injury no precautions can be required in advance. This would mean that notices requiring such precautions could not be issued. This interpretation is not correct because:

(a) it would not be *reasonable* to work in a situation where the necessary precautions had not been taken; and

(b) in order to take precautions it is necessary to foresee the potential harm, and such precautions will only be *suitable* if they are adequate to prevent the harm foreseen.

Therefore, if an inspector judges that the precautions taken will not prevent injury, he or she could issue a notice citing an apparent breach of reg.14.

(5) Inspectors should question all live working wherever they find it. This could be in many establishments and also where peripatetic electricians are working.

(6) The issue of accompaniment during live work is touched upon in the *Memorandum of*

guidance. The presence of a colleague who could render assistance if safe to do so could prevent injury or mitigate its extent.

WORKING SPACE, ACCESS AND LIGHTING (REG.15)

19 (1) This regulation only applies to the period during which work is being carried out.

(2) It can be used to prevent the storage of goods etc in front of switchboards on the basis that the act of operating a switching device is considered to constitute *work on* the equipment in question.

COMPETENCE TO PREVENT DANGER AND INJURY (REG.16)

20 (1) If competence is in doubt, inspectors should enquire into:

(a) technical knowledge, and

(b) experience

in relation to the work activity being undertaken. Clearly, more knowledge is required of those involved in high voltage work compared to those doing 25-volt test work.

(2) FCG support is available for assessing electrical competence.

(3) The regulation does not require authorisation of competent persons but in conjunction with regs.4 and 14 such authorisation may be required, when necessary, to avoid danger.

(4) The regulation does not specify any age limitations. The key requirements are adequate and relevant knowledge and experience, or an appropriate degree of supervision to allow persons to work safely and possibly to acquire those attributes.

DEFENCE (REG.29)

21 (1) The defence only becomes relevant once it has been established that an offence has been committed. It should not affect the judgement of the duty holder as to the steps he or she should take to meet an *absolute requirement*.

(2) Employers may suggest that they have taken *reasonable steps* to meet their obligations by the delegation of responsibility to adequately qualified and instructed staff. This approach is pre-empted by the specific duties placed upon employers and others by reg.3.

(3) FCG electrical specialists may be able to provide technical support in relation to a *due-diligence* defence.

EXEMPTIONS (REG.30)

22 (1) Any applications for an exemption should be forwarded, together with a full report, to CI 4, who will discuss the technical implications with TD 1B.

EXTENSION OUTSIDE GREAT BRITAIN (REG.31)

23 (1) The effect of the 1977 Order is to extend the application of these Regulations to offshore mining activities but not to oil rigs.

DISAPPLICATION OF DUTIES (REG.32)

24 (1) The EAW Regulations apply to all vehicles, except those exempted by this regulation.

(2) Sea-going ships are exempt in relation to normal shipboard activities under the direction of the Master, whether they are in dock or under way in an inland waterway or at sea.

(3) The term *sea-going* is not defined in these or any other health and safety regulations, but the intended meaning is clear and common to other regulations (eg Docks, COSHH).

(4) The reference to *any person* in reg.32(b) includes the employer.

KEY ISSUES ON WHICH THE EAW REGULATIONS AND ELECTRICITY (FACTORIES ACT) SPECIAL REGULATIONS 1908 AND 1944(PPLUS EXEMPTIONS) DIFFER

25 (1) Appendix 3 of the *Memorandum of guidance* gives information on reg.17 of the old Regulations in relation to the new provisions. The minimum dimensions for switchboard passage-ways are given tacit approval.

(2) Regulation 14 of the EAW Regulations covers all live working not just work on switchboards above 650 volts.

(3) There is no specific requirement under the EAW Regulations for the display of an electric shock placard or an abstract of the 1908/1944 Regulations. Occupiers should be told to remove abstracts but advised to retain placards where these are appropriate (see page 32, para 23 of *Memorandum*). There is no objection to occupiers displaying the new Regulations in placard form if they desire.

(4) There are no voltage bandings in the EAW Regulations.

(5) There are differences in definitions between old and new. In particular *conductor and danger* have different meanings in the EAW Regulations.

(6) Regulation 5 of the EAW Regulations corresponds to reg.1 of 1908 but is confined to the prevention of electrical danger. It does not cover machine malfunctions from electrical faults. All at risk are covered by reg.5, not just employees.

(7) Under reg.6 of the EAW Regulations (as opposed to reg.27 of 1908) it is no longer necessary to show that equipment is or has been exposed to a flammable atmosphere. A foreseeable exposure will suffice.

(8) Regulation 8 of the EAW Regulations applies to all conductors, unlike reg.21 of 1908 which only applied to exposed metalwork.

(9) Regulation 13 of 1908 required the earthing of mobile generators. Under the EAW Regulations, reg.8 permits alternative approaches where earthing is not practicable.

(10) The EAW Regulations contain no specific requirement for the written authorisation of competent persons, although authorisation may be required when necessary to avoid danger.

CANCELLATION OF INSTRUCTIONS

26 HSEM 1990/5 - cancel and destroy.

27 FOD Code LCR, Electricity (Factories Act)

Special Regulations 1908 and 1944) - cancel and destroy.

28FOD Code LCR, Index, page 2 - delete reference to Electricity (Factories Act) Special Regulations 1908 and 1944.

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ASI HEADINGS

Electricity at Work Regulations 1989.

APPENDIX (para 5(5))

ELECTRICAL SAFETY AND ENFORCEMENT IN DOMESTIC PREMISES

1 HSW Act s.3 and EAW Regulations apply to installation, maintenance and repair work in domestic premises. The Consumer Protection Act applies only to the provision of electrical goods or products, eg sockets etc but not to their installation.

2 Therefore, there is a possibility of inspectors becoming involved in questions of electrical safety at domestic premises. Unlike gas safety, however, there are no specific regulations. Inspectors have no powers of entry unless work activity is in progress and there are no requirements to report defects.

3 The only electrical accidents in domestic premises reportable under RIDDOR are those resulting in death or injury to an employee as a result of work activity and the normal criteria should be applied by inspectors in considering whether to investigate or not. FCG electrical inspectors should be involved in the investigation of fatal accidents in accordance with FOD Code LP Kb 11.

4 Inspectors may also learn of the death or injury of a self-employed person carrying out electrical work, or of a domestic electricity consumer as a result of work activity. Deaths (but not injury) may be investigated by an electricity PLC on behalf of a coroner in England and Wales. The coroner has no specific obligation to notify HSE in these circumstances. If an inspector is approached about such an incident, investigation would be determined by the application of the usual criteria. Similar considerations would apply to any approach from a Procurator Fiscal in Scotland.

5 Apart from such investigations, inspectors should decline to be involved where consumers are seeking redress against an electrical contractor. In these circumstances,

inspectors are advised to recommend strongly that the consumer seeks assistance from an electricity PLC, an NICIEC contractor or other reputable contractor who can make the situation safe, ensure continuation of use by the consumer of the appliance or system, and provide a technical opinion on the condition of the installation. This service will, of course, be charged for.

6 Inspectors should refuse to inspect domestic electrical installations other than as necessitated by an investigation and should decline involvement in the contractual arrangements between consumer, and electrical and/or building contractors.

