Electricity At Work Regulations 1989

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PURPOSE

To require precautions to be taken against the risk of death or personal injury from electricity in work activities.

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A little knowledge is often sufficient to make electrical equipment function but a much higher level of knowledge and experience is usually needed to ensure safety.

EAWR 1989 Memorandum of Guidance – Introduction (4)

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SCOPE

THE REGULATIONS APPLY TO:-

ALL electrical equipment - from battery operated hand lamps to 400kV transmission lines.

ALL workplaces - including, schools, colleges & public buildings.

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Regulation 1

Citation & commencement

What the Regulations are known as & when they came into force (April 1990)

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Regulation 2

Definitions

SYSTEM - an electrical system in which all of the electrical equipment is, or may be, connected to a common source of electrical energy

ELECTRICAL EQUIPMENT - anything used, or intended to be used, to generate, control, distribute, and use electricity

CONDUCTORS - anything that is capable of conducting electrical energy

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Regulation 2

Definitions (cont'd)

CIRCUIT CONDUCTOR - a conductor intended to carry an electric current or to be energised in normal conditions, excluding a conductor provided solely to perform a protective function, (such as an earth wire).

DANGER - the risk of injury & is, therefore, a quantifiable term

INJURY - death or personal injury by electric shock, burn, fire, explosion or arcing initiated by, & associated with, electrical energy.

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Regulation 3

Persons on whom duties are imposed by these Regulations

Duties are placed on EVERYONE : employers, employees & the self-employed, to comply with the Regulations

IN SO FAR AS THEY RELATE TO MATTERS WITHIN AN INDIVIDUALS CONTROL

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Regulation 3 (cont'd)

Some duties are qualified by the term

"REASONABLY PRACTICABLE"

The Duty Holder must assess the magnitude of risk against the expense of minimising or eliminating the risk. The greater the risk the less weight given by the Courts to the cost of preventing it.

It is a matter of professional judgment based upon training, experience and qualification. This is otherwise known as

COMPETENCE

which is governed by the requirements of Regulation 16

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Regulation 3 (cont'd)

If the requirement is "**ABSOLUTE**", e.g. if it is not qualified by the term "reasonably practicable", the requirement MUST be met regardless of cost or any other consideration.

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Regulation 4

Systems, work activities & protective equipment

This is an all-embracing Regulation that requires that :

(i) Systems shall be so constructed & maintained as may be necessary to prevent DANGER

(ii) Any work activities on or near electrical equipment shall be carried out in such a manner as not to give rise to DANGER

(iii) Equipment provided for the purpose of protecting persons shall be suitable for use, shall be maintained for the use for which it is provided, & be properly used.

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Regulation 5

Strength & capability of electrical equipment

No electrical equipment shall be put into use unless it is capable of withstanding the thermal, electromagnetic, or other effects (inc. fault conditions of electricity)

It is recommended that equipment be used within the manufacturers rating & in accordance with any instructions provided

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Regulation 6

Adverse or hazardous environments

Electrical equipment which may be "reasonably forseeable" be exposed to :

- mechanical damage
- the effects of weather
- the effects of wet, dirty, dusty or corrosive conditions
- any flammable or explosive substance

shall be so constructed, or protected, as may be necessary to prevent danger

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Regulation 7

Insulation, protection & placing of conductors

All conductors in a system must be suitably covered with an insulating material (this does not include electrical tape) and installed in such a manner that will prevent danger.

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Regulation 8

Earthing or other precautions

Where non-circuit conductors, such as metal enclosures, conduit & trunking, may "reasonably forseeable" become charged with electricity, this Regulation states that such items must be connected to earth or protected by other suitable means in order to prevent danger.

Such dangers usually arise during fault conditions & the object of earthing is to ensure the immediate discharge to earth of the fault current. The earthing conductors must be of sufficient strength & current carrying capability to be able to conduct the fault current to earth without giving rise to danger.

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Regulation 8 (cont'd)

Additional techniques in support of the precautions taken to meet this Regulation may include :

DOUBLE INSULATION – e.g. modern portable electric tools where there are no external metal parts

EQUIPOTENTIAL BONDING – is the bonding together of all exposed extraneous conductors & connecting them to earth. This eliminates the potential for any dangerous voltages to occur between them

USE OF SAFE VOLTAGES – are commonly used for portable equipment in highly conductive locations such as boilers & tunnels. By limiting the phase to earth voltage to less than 110V. The fatal shock potential is greatly reduced

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Regulation 8 (cont'd)

EARTHING – is necessary to protect the user & enable faults to be detected & the supply disconnected automatically

The amount of fault current will depend upon the earth fault loop impedance, the parameters of which may be found in the I.E.T. Wiring Regulations (Appendix 2)

All earthing & bonding conductors must be capable of carrying the fault current & be adequate to withstand likely wear & tear.

RESIDUAL CURRENT DEVICES – must be used when supplying portable appliances due to the potential high impedance of the protective conductor

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Regulation 9

Integrity of referenced conductors

The object of this Regulation is to prevent referenced circuit conductors achieving a significantly different potential from the reference connection point by restricting the placing of electrical devices in those conductors.

This Regulation has particular application to systems that use combined neutral-earth conductors.

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Regulation 10

Connections

Every joint & connection in a system must be mechanically & electrically suitable for use in order to prevent danger.

This includes all plugs, sockets & terminations in portable equipment.

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Regulation 11

Means for protecting from excess of current

Every part of an electrical system must be provided with efficient means, & be suitably located, for cutting off excess current, such as overloads & short-circuits.

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Regulation 12

Means for cutting off the supply

This Regulation is in two parts :

(i) Suitable means must be available for **switching off** the electrical supply in order to prevent danger (this includes the use of manual switches & circuit breakers operated by "Stop" push-buttons)

(ii) Suitable means must be provided to ensure that the supply will remain switched off & inadvertent reconnection is prevented

This is commonly know as **ISOLATION** & the switch requires the provision of a locking mechanism

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Regulation 13

Precautions for work on equipment made dead

Adequate precautions must be taken to prevent isolated equipment becoming electrically charged whilst work is being carried out, either on or near that equipment

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Regulation 13 (cont'd)

Such precautions could include :

- Using the Permit-to Work system
- Identification of the equipment being worked on
- Making the equipment dead by means of isolation
- Screening the dead equipment from adjoining live equipment
- The fitting of "Danger" notices
- Proving dead using an approved test instrument
- Earthing the circuit to prevent it becoming charged

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Regulation 14

Work on or near live conductors

No person shall be engaged in any work activity on or so near any un-insulated live conductor that danger may arise unless :

(i) it is unreasonable in all of the circumstances for it to be dead and

(ii) it is reasonable in all circumstances for any person to be at work on or near such conductor while it is live, and,

(iii) suitable precautions (including, where necessary, the provision of suitable protective equipment) are taken to prevent injury

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Regulation 14 (cont'd)

Whilst it is always preferable for work to be undertaken under dead conditions, this Regulation recognises' that it is not always practical to do so, for example :

- testing, measurement & fault finding
- cable jointing
- maintenance of overhead distribution systems

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Regulation 14 (cont'd)

If, for any reason, live work must be undertaken, adequate safety precautions must be taken. These may include :

- adequate information on foreseeable risks & precautions to be taken to minimise such risks
- the use of suitable instruments, insulated tools & protective clothing
- effective control of the working area
- two people working together if the presence of the other person will significantly contribute to ensuring injury is prevented

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Regulation 15

Working space, access and lighting

"The purpose of this Regulation is to ensure that sufficient space, access, and adequate illumination are provided while working on, at, or near, electrical equipment so that they may work safely".

"Where there are dangerous exposed live conductors within reach the working space dimensions should be adequate :

- to allow people to pull back away from the conductors without hazard
- if people need to pass one another, to do so with ease and without hazard"

"Whatever level of lighting is used, it must be adequate to enable injury to be prevented".

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Regulation 16

Persons to be competent to prevent danger & injury

This Regulation is crucial to safe methods of work & is as follows :

" No person shall be engaged in any work activity where technical knowledge or experience is necessary to prevent danger or, where appropriate, injury, unless he possesses such knowledge or experience, or is under such degree of supervision as may be appropriate having regard to the nature of the work"

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Regulation 16 (cont'd)

With regard to the competence of those individuals undertaking the work, & those supervising it where applicable, & in order to prevent danger or injury, these persons must have :

- adequate knowledge of electricity
- adequate experience of electrical work
- adequate understanding of the system to be worked on & practical experience of that class of system
- understanding of the hazards which may arise during the activity & the precautions that need to be taken
- the ability to recognise at all times whether it is safe for work to continue

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Regulation 29

Defence

This Regulation only applies in criminal proceedings.
It provides a defence for a duty holder who can establish that he took all reasonable steps & exercised due diligence to avoid committing an offence under the Regulations

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Regulation 30

Exemption certificates

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Regulation 31

Extensions outside Great Britain

Offshore

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Regulation 32

Disapplication of duties

Sea-going ships, Aircraft, Hovercraft, Vehicles

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Regulation 33

Revocations and modifications

Replacement of regulations of section 1(2) HASAWA 1974
Overriding