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**AIDS HELPLINE: 0800-0123-22 Prevention is the cure**

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**GOVERNMENT NOTICE****DEPARTMENT OF LABOUR****No. R. 183****4 March 2005****NOTICE OF DRAFT AMENDMENT****ELECTRICAL MACHINERY REGULATIONS**

The Minister of Labour intends, in terms of section 43 of the Occupational Health and Safety Act, 1993 on the recommendation of the Advisory Council for Occupational Health and Safety to repeal the Electrical Machinery Regulations, 1988 and supersede it by wording in accordance with the Schedule.

Interested persons are invited to submit any substantiated comments or representations on the proposed regulations to the Director General of Labour, Private Bag X117, Pretoria, 0001 (for the attention of the chief inspector: Occupational Health and Safety), within 90 days of the date of publication of this notice.

# **OCCUPATION HEALTH AND SAFETY ACT, 1993 (ACT NO. 85 OF 1993)**

**SCHEDULE****ELECTRICAL MACHINERY REGULATIONS****DEFINITIONS**

**1** In these regulations any word or expression to which a meaning has been assigned in the Act shall have that meaning and, unless the context otherwise indicates

“**accreditation authority**” means the South African National Accreditation System (SANAS);

“**annexure**” means an annexure to these regulations;

“**approved inspection authority for electrical machinery**” means a person or body approved by the chief inspector in terms of these regulations to carry out the inspection, testing and investigation of electrical machinery;

“**authorized person**” means a person who has been granted, in writing, defined authority and responsibilities by the designated person in terms of the relevant operating regulations;

“**circuit**” means an arrangement of conductors for the purpose of carrying electrical energy;

“**conductor**” means an electrical conductor arranged to be electrically connected to a source of electrical energy;

“**confined space**” means an area as defined in regulation 1 of the General Safety Regulations published by Government Notice No. R. 1031 of 30 May 1986;

“**dead**” means at or about zero potential and isolated from any live system;

“**earthed**” means connected to the general mass of earth in such a manner as will ensure at all times an immediate safe discharge of electrical energy;

“**electrical fence**” means an electrified barrier against the trespass of persons or

animals which consists of one or more bare conductors;

**“electrical installation”** means any machinery, in or on any premises, used for the transmission of electricity from a point of control to a point of consumption anywhere on the premises, including any article forming part of such an installation irrespective of whether or not it is part of the electrical circuit, but excluding -

- (a) any machinery of the supplier related to the supply of electricity on the premises;
- (b) any machinery which transmits electricity energy in communication, television or radio circuits;
- (c) an electrical installation on a vehicle, vessel, train or aircraft.

**“fence energiser”** means electrical machinery arranged so as to deliver a periodic non-lethal amount of electrical energy to an electric fence connected to it;

**“insulated”** means covered with insulating material of such thickness and properties that it will prevent the flow of electrical energy between the object so covered and its surroundings or any external object in contact with it;

**“live” or “alive”** means electrically charged;

**“miniature substation”** means a substation that a person cannot enter;

**“overhead service connections” or “service connections”** means the conductors between the supplier’s mains and the consumer’s electrical installations;

**“portable electric tool”** means any electrically operated implement, with the exception of ordinary household electrical appliances, which is designed for use with -

- (a) a flexible cord at the supply end and which is intended for use by hand and to be carried by hand at the place of work; or
- (b) a flexible cable at the supply end and which is intended for use by hand and to be moved by hand at the place of work;

**“reasonably and practicably safe”**, in relation to an electric fence installation, means electric fence that existed prior to the publication of these current regulations;

**“supplier”**, in relation to a particular electrical installation, means any body or person who supplies or contracts or agrees to supply electricity to that electrical installation;

**“system”** means an electrical system in which all the conductors and devices are electrically connected to a common source of electrical energy;

**“voltage”** means the difference in electrical potential between any two conductors or between a conductor and the earth.

### **Scope of application**

**2 (1)** These regulations shall apply to the designers, manufacturers, installers, sellers, users, employers and suppliers of electricity who are designing, manufacturing, selling, installing or using electrical articles and supplying electricity.

**(2)** These regulations shall apply to electricity generation, transmission and distribution lines whether overhead or underground to the point of supply, where the point of supply is not the point of control.

### **Electrical personal protective equipment**

**3** The employer or user shall provide free of charge and maintain in good condition such protective equipment as may be necessary to prevent accidents, for use by persons engaged in working on or in close proximity to live electrical machinery or dead electrical machinery which may become live.

### **Working on disconnected electrical machinery**

**4(1)** The employer or user shall, whenever work is to be carried out on any electrical machinery which has been disconnected from all sources of electrical energy but which is liable to acquire or to retain an electrical charge, as far as is practicable, cause precautions to be taken by earthing or other means to discharge the electrical energy to earth from such electrical machinery or any adjacent electrical machinery if there is danger therefrom before it is handled and to prevent any electrical machinery from being charged or made live while persons are working thereon. This shall exclude all electrical machinery not connected to the electricity supply.

**(2)** All the work on disconnected electrical machinery must be carried out by an authorized person.

### **Notices**

**5** The employer or user shall cause notices in English and any other official language prevalent in the area to be displayed within, and at all designated entrances to the premises, as the case may be, where generating plant and transforming, switching or linking apparatus are situated, which notices -

- (a) prohibit unauthorized persons from entering such premises;
- (b) prohibit unauthorized persons from handling or interfering with electrical

machinery;

- (c) contain directions of procedure in case of fire; and
- (d) contain directions on how to resuscitate persons suffering from the effects of electric shock:

Provided that this regulation shall not apply to miniature substations and distribution boxes, on condition that their access doors can be locked or bolted and that only authorized persons are permitted to open them and work thereon.

### **Switchgear and transformer premises**

**6 (1)** The employer or user shall cause enclosed premises housing switchgears and transformers -

- (a) to be sized to provide clear working space for operating and maintenance staff;
- (b) to be sufficiently ventilated to maintain the equipment at a safe working temperature;
- (c) to be, as far as is practicable, constructed so as to be proof against rodents, leakage, seepage and flooding;
- (d) to be provided with lighting that will enable all equipment, thoroughfares and working areas to be clearly distinguished and all instruments, labels and notices to be easily read;
- (e) to have doors or gates which can be readily opened from the inside, opening outwards;
- (f) to be provided with fire extinguishing appliances or systems which are suitable for **use on electrical machinery and which are maintained in working conditions**: Provided that, in the case of unattended premises, suitable fire extinguishing appliances need only be made available at such premises when work is in progress thereon or therein; and
- (g) to be of such construction that persons cannot reach in and touch bare conductors or exposed live parts of electrical machinery.

(2) No person, other than a person authorized thereto by the employer or user shall enter, or be required or permitted by the employer or user to enter premises housing switchgears or transformers, unless all live conductors are insulated against inadvertent contact or are screened off: Provided that such person is under the supervision or the control of authorized person.

## Electrical Control Gear

**7(1)** The employer or user shall provide every electrical installation and power line with controlling apparatus and protective devices which shall, as far as is reasonably practicable, be capable of automatically isolating the power supply in the event of a fault developing on such installation or power line.

(2) No employer or user shall place a switch, circuit breaker or fuse in the neutral conductor of a polyphase alternating current or three-wire direct current distribution system unless such switch, circuit breaker or fuse is so arranged as to isolate all phase conductors and the neutral conductor simultaneously: Provided that this shall not include an isolating link on the neutral conductor installed for test purposes or to prevent circulating currents.

(3) The employer or user shall, whenever reasonably practicable, provide switchgear ~~with an interlocking device so arranged that~~ the door or cover of the switch cannot be opened unless the switch is in the "off" position and cannot be switched on unless the door or cover is locked.

(4) The employer or user shall mark or label all controlling apparatus permanently so as to identify the system or part of the system or the electrical machinery which it controls, and where such control apparatus is accessible from the front and the back these markings shall be on both the front and the back.

(5) The employer or user shall post a notice at switchgear or control gear which has been switched off or locked out to enable persons to work on electrical machinery or other machinery operated by electricity and controlled by such switchgear or control gear, warning against reclosing such switchgear or control gear.

(6) No person shall act contrary to a warning in terms of subregulation (5).

## Switchboards

**8** The employer or user shall provide an unobstructed space for operating and maintenance staff at the back and front of all switchboards, and the space at the back shall be kept closed and locked except for the purpose of inspection, alteration or repair: Provided that the requirements of this regulation with respect to the unobstructed space at the back of the switchboard shall not apply in the case of -

- (a) switchboards that have no uninsulated conductors accessible from the back;
- (b) switchboards that are of a totally enclosed construction;
- (c) switchboards that have backs which are only accessible through an opening in the wall or partition against which they are placed, such openings being kept closed and locked; and

- (d) switchboards that can be safely and effectively maintained from the front and which have all parts accessible from the front.

### **Electrical machinery in hazardous locations**

**9(1)** Employers or users shall identify all hazardous locations and classify them accordingly.

(2) No person may use electrical machinery in locations where there is danger of fire or explosion owing to the presence, occurrence or development of explosive or flammable articles, or where explosive articles are manufactured, handled or stored, unless such electrical machinery with regard to its construction relating to the classification of the hazardous locations in which it is to be used meets the requirements of a safety standard incorporated for this purpose in these regulations under section **44** of the Act.

(3) Every employer or user referred to in subregulation (1) shall be in possession of a certificate in a form acceptable to the chief inspector, which has been issued by an approved test laboratory, in which it is certified that the electrical machinery referred to in terms of subregulation (1) has been manufactured and tested for the groups of dangerous articles in terms of the safety standard which has been incorporated in these regulations for this purpose under section **44** of the Act: Provided that in lieu of such certificate an inspector may approve permanent labeling on such machinery which contains all the relevant information.

(4) When diverse items of electrical machinery such as motors, cables and control apparatus are used together to form an electrical installation, the employer or user shall ensure that the selection, arrangement, installation, protection, maintenance and working of the installation results in no less a degree of safety than when the individual items of such machinery are used separately.

(5) The employer or user shall use electrical machinery to which this regulation applies only under such conditions and in such surroundings as prescribed in the safety standard referred to in subregulation (2).

(6) No employer or user shall effect repairs or adjustments to or otherwise work on electrical machinery under conditions envisaged by subregulation (1) unless such machinery has been rendered dead and effective measures have been taken to ensure that such machinery remains dead.

(7) Wherever there is a possibility of the formation of static electricity under working conditions, the employer or user shall earth all metallic structures, machine parts, pneumatic conveyor ducts and pipelines conveying flammable articles and the like, or take such other measures as may be necessary to prevent the formation of electric sparks.



(8) The employer or user shall cause all electrical machinery to which these regulations apply to be examined and tested at intervals not exceeding two years, or any other interval approved by the chief inspector after an approved risk assessment has been conducted by a person who is competent to express an opinion on the safety thereof: Provided such person is the holder of a master installation electrician certificate.

(9) The person carrying out the examination referred to in subregulation (6) shall enter the results of each examination in a record which shall be kept by the employer or user for this purpose and subjected to be examined by the inspector: Provided that where such machinery is subject to adverse climatic or physical conditions the frequency of such examinations shall be increased to intervals of not longer than one year or such shorter period as circumstances may necessitate.

(10) The intrinsically safety equipment shall not be tested, but be verified in terms of approved design.

### **Portable electric tools**

**10(1)** No employer or user shall use or permit the use of a portable electric tool with an operating voltage that exceeds 50 V to earth unless -

- (a) it is connected to a source of electrical energy incorporating an earth leakage protection device, the construction of which meets the requirements of a safety standard incorporated for this purpose in these regulations under section **44** of the Act; or
- (b) it is connected to a source of electrical energy through the interposition between each tool and the source of an individually double-wound isolating transformer, the secondary winding of which is not earthed at any point and the construction of which meets the requirements of a safety standard incorporated for this purpose in these regulations under section **44** of the Act; or
- (c) it is connected to a source of high frequency electrical energy derived from a generator which **is used** solely for supplying energy to such portable electric tool and which arrangement is approved by the chief inspector; or
- (d) it is clearly marked that it is constructed with double or reinforced insulation.

**(2)** No person shall sell a portable electric tool constructed with double or reinforced insulation referred to in subregulation (1)(d) unless—

- (a) it is clearly marked that it is constructed with such insulation; and
- (b) its insulation is constructed in accordance with a safety standard incorporated for this purpose in these regulations under section 44 of the Act.

**(3)** No employer or user shall use or permit the use of a portable electric tool which is not fitted with a switch to allow for easy and safe starting and stopping of the tool.

**(4)** The employer or user shall maintain every portable electric tool, together with its flexible cord and plug, in a serviceable condition.

### **PORTABLE ELECTRIC LIGHTS**

**11(1)** No employer or user shall use or permit the use of a portable light the operating voltage of which exceeds 50 unless -

- (a) it is fitted with a substantial handle which is made of non-hygroscopic, non-conducting material;
- (b) all live metal parts or parts which may become live owing to a faulty circuit are completely protected against accidental contact;
- (c) the lamp is protected by means of a substantial guard firmly fixed to the insulated handle; and
- (d) the cable lead-in is such that the insulation can withstand rough use.

**(2)** No employer or user shall use or permit the use of a portable electric light in wet or damp conditions or in closely confined spaces inside vessels or when he is in contact with large masses of metal, unless, subject to the provisions of subregulation (1) -

- (a) the lamp is connected to a source of electrical energy incorporating an earth leakage protection device the construction of which meets the requirements of a safety standard incorporated for this purpose in these regulations under section 44 of the Act; or
- (b) the operating voltage of the lamp does not exceed 50 V, and where this electrical energy is derived from a transformer such transformer shall have separate windings.

## Electric fences

**12 (1)** No employer or user shall install a fence energiser that delivers impulses of electrical energy exceeding the following values to an electric fence:

Peak value of voltage .....	10 kV
Maximum duration of impulse .....	50 ms
Minimum interval between impulses .....	0,75 s
Maximum quantity of electricity per impulse .....	2,5 mC
Maximum energy discharge per impulse measured at a resistance of 500 ohms .....	<b>8J</b>

**(2)** The user shall ensure that every fence energiser -

- (a) is constructed **so** as to exclude dust and water; and
- (b) is not installed in dusty locations or locations where there is a fire hazard.

**(3)** The user shall not install a fence energiser that receives its energy from an electric supply system —

- (a) in locations where the energiser is likely to sustain mechanical damage **or** be tampered with;
- (b) on any pole of an overhead power or communication line except poles which carry the conductors of the energiser; and
- (c) unless the output circuit is isolated from the supply by means of a double-wound isolating transformer.

**(4)** The user of a fence energiser shall -

- (a) cause the earth of every fence energiser to be free and at least 2 m away from the earth of any other electrical system; and
- (b) not electrify barbed-wire but only smooth wire **or** such articles as **will** enable a person touching it to let go immediately: Provided that smooth wires attached to barbed-wire fences may be electrified.

**(5)** In the case of a fence energiser, which receives its energy from a battery charged by means of a charging apparatus, which receives its power from an electric supply, the employer or user shall ensure that the charging apparatus is of double-wound isolation construction.

(6) When an electric fence is installed along a public road or in an urban area the user shall -

- (a) as far as practicable mount the electrified wires or articles in such positions that persons cannot inadvertently come into contact therewith; and
- (b) conspicuously display notices warning people that the property is protected by an electric fence.

(7) The electric fence shall only be installed in accordance with safety standards incorporated into these regulations under section 44 of the Act.

(8) All electric fences shall have a certificate of compliance issued by an electric fence installer: Provided that if the electric fence was installed before 1 January 2006 it shall be reasonably and practicably safe.

#### **Electric fences installer**

**13 (1)** (a) Application for registration as an electric fence installer shall be made to the chief inspector in form prescribed in Annexure 2.

- (b) The application form shall be accompanied by the fee determined in terms of regulations 25.

(2) Any natural person who satisfies the chief inspector that he -

- (a) has sufficient knowledge of the safety standards applicable to the electric fence installation;
- (b) has been registered as an installation electrician or master installation electrician, as the case may be;
- (c) meets any other requirements as may be prescribed by the chief inspector shall at the discretion of the chief inspector be registered as an electric fence installer; and
- (d) the chief inspector shall furnish such person with the certificate of registration, subject to such conditions or restrictions as he may deem necessary and enter such registration in national database.

(3) An electric fence installer shall on request produce his certificate of registration to any inspector, and any supplier or any person for whom he intends to install an electric fence and issue a certificate of compliance.

**(4)** If, in the opinion of the chief inspector, a person who is the holder of a certificate of registration has been found guilty of gross negligence in the execution of his duties, or is no longer deemed competent to perform his or her duties, the chief inspector may suspend or cancel such registration.

### **Substitution of lost, damaged or destroyed certificate of registration**

- 14(1)** (a) If a registration certificate issued in terms of regulations 13 has been lost, damaged or destroyed, the electric fence installer may apply for a duplicate in the form of Annexure 2.
- (b) The application shall be accompanied by the fee determined in terms of regulation 25.
- (c) After a proof that a certificate of registration has been lost, damaged or destroyed, the chief inspector shall issue a substitute therefore on which the word "duplicate" will appear.

### **Inspection authorities**

**15 (1)** The chief inspector may approve as an inspection authority any juristic person or body that has been accredited by the accreditation authority as an approved inspection authority for performing the prescribed functions with regard to the manufacture or testing of electrical machinery.

(2) Application for approval shall be made to the chief inspector in the form of Annexure 1.

(3) The application form shall be accompanied by the fee determined in terms of regulation 25.

(4) The chief inspector may determine such additional requirements as he may deem necessary.

(5) The chief inspector may withdraw any approval of an inspection authority at any time.

### **Earthing**

**16 (1)** The employer or user shall cause -

- (a) roofs, gutters, downpipes and waste pipes on premises to which electrical energy is supplied to be earthed, except -

- (i) where the operating voltage does not exceed **50 V**;
  - (ii) roofs made of non-conductive material or metal roofs covered by non-conductive material;
  - (iii) gutters, downpipes and waste pipes made of non-conductive material or gutters and downpipes attached to a metal roof which is covered by non-conductive material;
  - (iv) roofs, gutters, downpipes and waste pipes on premises which receive electricity by means of underground service connections: Provided that the connection is to the conductive structures;
- (b) all accessible metallic parts of electrical machinery which, though normally not forming part of an electrical circuit, may become alive accidentally, to be protected by an insulating covering or otherwise enclosed or to be earthed, except -
- (i) metal in earth-free situations, other than runs of metal wireway and the close-fitting metal sheathing and armouring of cables;
  - (ii) short separate lengths of heavy-gauge metal wire way used for the mechanical protection of cables where such cables are not used in the secondary circuits of discharge laminair installations;
  - (iii) short, unexposed, separate lengths of metal wireway used for the mechanical protection of insulated wiring passing through walls, floors, partitions or ceilings;
  - (iv) metalwork of fixed electrical machinery where such metalwork is more than **2,4 m** above the floor: Provided that this exception shall not apply where such metalwork is situated in any position likely to become damp, or in an elevator shaft, or near rotating machinery, or in contact with a wall, ceiling or other support constructed of or covered with conducting material;
  - (v) metal parts of electrical machinery where such parts are enclosed or shrouded by insulating material so that such metal parts cannot be touched;
  - (vi) cleats, clips, saddles, clamps of other devices for fixing wire ways and cables;
  - (vii) shades, reflectors and guards supported on lamp holders or discharge laminair;
  - (viii) lamp caps;

- (ix) metal parts of or screws in or through non-conducting materials which are separated by such materials from current-carrying parts and from earthed non-current-carrying parts in such a way that in normal use they cannot become live or come into contact with earthed parts.

(2) If at any time through a test of any electrical installation on a premises by the supplier or inspector it is found that the roofs, gutters, downpipes and waste pipes of the premises or exposed metallic parts of the electrical installations as contemplated in subregulation (1) are not earthed, the supplier or inspector shall require the occupier or owner of such premises to effect the necessary earthing within a fixed period of not more than 30 days and, should the occupier or owner fail to comply with such requirements, the supplier may disconnect the electrical energy to such premises and shall not reconnect such energy until the earthing has been carried out to this satisfaction.

### supports

17 The supplier, employer or user shall cause the supports for power lines to be so designed as to provide the following minimum factors of safety -

	Based on type-tested breaking strength	Based on calculated breaking strength	Based on modulus rupture
Steel lattice towers and cross-arms	2,5	2,5	-
Solid drawn steel poles	2,0	2,5	-
Welded steel poles and steel poles with swaged or telescope joints	2,2	2,5	-
Stay assemblies	2,5	2,5	-
Reinforced concrete spun poles	2,4	3,5	-
Mechanically vibrated reinforced concrete structures and components	2,5	3,5	-
Other types of reinforced concrete structures and components	2,75	3,75	-

Wooden members not continuously loaded	3,5	-	2,7
Wooden members subjected to continuous loading	5,5	-	4,5

Provided that in calculating the factors of safety the supplier, employer or user shall assume that -

- (a) there are no broken conductors;
- (b) every line conductor, cable or wire carried by the support is at a temperature of **-5°C**;
- (c) line conductors, together with the supports, are subjected to a wind pressure of 700 Pa; and
- (d) in the case of lattice structures the area for calculating the force due to wind pressure is 1,5 times the projected area of the members of one side and, in the case of round, elliptical or hexagonal poles, conductors and wires, the area is 0,6 times the projected area.

### **Clearances of power lines**

**18(1)(a)** The supplier or user shall cause the minimum clearances of electric conductors and other wires of power lines, excluding overhead service connections and line conductors having a voltage not exceeding 1,1 kV rms consisting of insulated wire of a type which complies with a safety standard incorporated for this purpose in these regulations under section 36 of the Act, to be not less than the clearances indicated in the table below:

Provided that these figures are based on the assumption that clearances shall be determined for a minimum conductor temperature of **50°C** and a swing angle corresponding to a wind pressure of 500 Pa: Provided further that where under normal conditions power line conductors operate at a temperature above **50°C**, the clearance at the higher temperature at which the conductors operate shall be in accordance with the clearances indicated in the table.

(b) The supplier, employer or user shall cause the clearances of conductors and other wires over the normal high-water level of power lines crossing over water to be less than the values for power lines above the ground outside townships: Provided that if the owner of the land on which the water is situated requires a greater clearance and no agreement can be reached, the dispute shall be referred to the chief inspector for a decision.



(c) The supplier, employer or user shall cause the distance of any **power** line from an explosives magazine to comply with the requirements of the Explosives Act, 1956 (Act No. 26 of 1956).

<b>MINIMUM CLEARANCE IN METRES</b>						
MINIMUM VOLTAGE FOR WHICH INSULATION IS DESIGNED, KV RMS PHASE-TO-PHASE	MINIMUM SAFETY CLEARANCE	ABOVE GROUND OUTSIDE TOWNSHIPS	ABOVE GROUND IN TOWNSHIPS	ABOVE ROADS IN TOWNSHIPS, PROCLAIMED ROADS OUTSIDE TOWNSHIPS, RAILWAYS AND TRAMWAYS	TO COMMUNICATION LINES, OTHER POWER LINES OR BETWEEN POWER LINES AND CRADLES	TO BUILDINGS, POLES AND STRUCTURES NOT FORMING PART OF POWER LINES
1,1 or less	-	4,9	5,5	6,1	0,6	3,0
7,2	0,15	5,0	5,5	6,2	0,7	3,0
12	0,20	5,1	5,5	6,3	0,8	3,0
24	0,32	5,2	5,5	6,4	0,9	3,0
36	0,43	5,3	5,5	6,5	1,0	3,0
48	0,54	5,4	5,5	6,6	1,1	3,0
72	0,77	5,7	5,7	6,9	1,4	3,2
100	1,00	5,9	5,9	7,1	1,6	3,4
145	1,45	6,3	6,3	7,5	2,0	3,8
245	1,85	6,7	6,7	7,9	2,4	4,2
300	2,35	7,2	7,2	8,4	2,9	4,7
362	2,90	7,8	7,8	9,0	3,5	5,3
120	3,20	8,1	8,1	9,3	3,8	5,6
800	5,50	10,4	10,4	11,6	6,1	8,5

533 kV DC*	3,70	8,6	8,6	9,8	4,3	6,1
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\*Maximum voltage to earth for which insulation is designed.

(2) No person shall construct any road, railway, tramway, communication line, other power line, building or structure, or place any material or soil under or in the vicinity of a power line, which will encroach on the appropriate minimum clearances prescribed in terms of subregulation (1).

(3) No person shall encroach in person or with objects on the minimum safety clearances prescribed in subregulation (1) or require or permit any other person to do so except by permission of the supplier, employer or user operating the power line.

(4) The supplier, employer or user of power lines shall control vegetation in order to prevent it from encroaching on the minimum safety clearance of the power lines and the owner of the vegetation shall permit such control.

#### Protection of supporters

19 The employer or user shall ensure that all supports of the lattice type which are used to carry overhead conductors are adequately protected in order to prevent any unauthorized person from coming into dangerous proximity of the conductors by climbing such supports, and an inspector may require an employer or user to protect a support of any other type similarly.

#### Insulators and fittings

20 The supplier, employer or user shall ensure that the factor of safety of line insulators and fittings is at least 2,5 based on the type-tested breaking-strength of such insulators or fittings.

#### Conductors

21 The supplier, employer or user shall ensure that the factor of safety of every line conductor, including joints, is at least 2,5, which factor shall be based on the rated ultimate tensile strength of the conductor and shall be calculated on the assumption that the line conductor is at a temperature of  $-5^{\circ}\text{C}$  and that it is simultaneously subjected to a wind pressure at right angles to the line equivalent to 700 Pa on 0,6 of the projected area of the conductors.

### Overhead service connections and overhead service conductors

**22(1)** No supplier, employer or user shall require or permit any overhead service connection to be connected to the supplier's mains elsewhere than at a point of support.

(2) Every supplier, employer or user shall cause every part of -

- (a) overhead service connection; and
- (b) overhead service conductors from the one building to another,

to consist of insulated wire of a type that complies with a safety standard incorporated for this purpose in these regulations under section 44 of the Act.

(3) No supplier, employer or user shall connect electrical energy to a building by means of overhead conductors unless the connection to the building is by means of a connector box of a type approved by the chief inspector, or by other means similarly approved.

### Overhead line crossings

**23(1)** Where a power line crosses a proclaimed road, railway or tramway, or a communication line, the supplier, employer or user shall cause the clearance to comply with the requirements of regulation 18, and shall further cause -

- (a) every structure supporting a crossing span to be designed in such a manner that it will be able to withstand the loads that may be imposed upon it should a breakage of any phase conductor or earth conductor occur;
- (b) every structure supporting a crossing span, as far as is reasonably practicable, to be located so that it will not touch the service crossed, should it overturn;
- (c) subject to the restrictions in paragraph (b), one of the structures supporting a crossing span to be located as close to the point of crossing as is reasonably practicable;
- (d) the clearance of the crossing span where it crosses a proclaimed road to be not less than 4,5 m in the case of a broken phase conductor in a span other than the crossing span;
- (e) armour rods or arcing horns to be fitted at the live ends of suspension and rigid insulators on at least the first three structures on each side of the crossing if the maximum voltage for which the power line is designed exceeds 1,1 kV rms; alternatively, duplicate conductors tied together at

intervals of not more than 1,5 m shall be provided in the crossing span and shall be supported by duplicate parallel insulators, and for lines on rigid insulators the duplicate conductors shall extend at least 1,5 m beyond the supports on each side of the crossing span;

- (9) the deviation from a right angle crossing over a communication line not to be greater than 30 degrees for lines with a voltage of 48 kV rms and above, and not greater than 45 degrees for lines below 48 kV rms; and
- (g) the clearance to comply with the requirements of regulation 15 and with paragraphs (b) and (c) of this subregulation in cases where a power line crosses another power line:

Provided that the chief inspector may approve any deviation of these requirements as specified in this subregulation subject to such conditions as he may determine.

(2) The supplier, employer or user shall cause every overhead service connection that crosses over bare communication lines of the communication network to have minimum clearances between the overhead service connection and the communication lines at the points of crossing of 0,5 m and the overhead service connection not to cross below bare communication lines.

### **Bare conductors on premises**

**24** The employer or user shall cause bare conductors other than conductors of a power line which cannot be completely insulated, such as crane trolley wires, and which are installed on premises, to be so placed as to prevent accidental contact therewith and warning notices to be prominently displayed at such conductors.

### **Fees payable**

**25** The Minister shall determine all the registration and related fees, which shall be payable in the form of uncanceled revenue stamps affixed to the relevant application form.

### **Offences and penalties**

**26** Any person who contravenes or fails to comply with the provisions of regulations 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 and 24 shall be guilty of an offence and liable on conviction to a fine or to imprisonment for a maximum period of 12 months and, in the case of a continuous offence, to an additional fine of R200 for each day on which the offence continues: Provided that the period of such additional imprisonment shall not exceed 90 days.

**27 Repeal of regulations**

The Electrical Machinery Regulations, 1988, published under Government Notice No. R. 1593 of 12 August 1998, are hereby repealed.

**Short title**

**28** These regulations shall be called the Electrical Machinery Regulations, 2006.

No R. 0000

1 January 2006

**OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT NO. 85 of 1993)****ELECTRICAL MACHINERY REGULATIONS****INCORPORATION OF SAFETY STANDARDS**

Under and by virtue of the powers vested in me by section 44 of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993), I, Membathisi Mphumzi Sherpard Mdladlana, Minister of Labour, after consultation with the Advisory Council for Occupational Health and Safety, hereby incorporate into the Electrical Machinery Regulations, 2006, the safety standards specified in the Schedule.

MMS Mdladlana  
Minister of Labour

**SCHEDULE****1. Regulation 9(2)****South African Bureau of Standards Code of Practice**

SANS 10108: The classification of hazardous locations and the selection of electrical apparatus for use in such locations.

SANS 1086-1: The installation and maintenance of electrical equipment used in explosive atmospheres.

SANS IEC 60335-2-76: 1997: The safety of household and similar electrical appliances. Part 2: Particular requirements for electric fence energisers.

SANS 10222-3: Electric security installations: Part 3: Electric security fences (non-lethal).

**Annexure 1**

**DEPARTMENT OF LABOUR**

**OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT NO. 85 OF 1993)**

**APPLICATION FOR APPROVAL AS AN APPROVED INSPECTION AUTHORITY FOR ELECTRICAL MACHINERY**

**The Department of Labour  
Occupational Health and Safety  
Private Bag X117  
Pretoria  
0001**

<p><b>R120,00</b></p> <p>Affix uncanceled SA revenue stamp(s)</p>
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**1. PARTICULARS OF APPLICANT**

SURNAME: .....

FIRST NAMES: .....

ID NO.: .....

TRADING NAME: .....

State whether the business is a **SOLE PROPRIETORSHIP/PARTNERSHIP/COMPANY/CLOSE CORPORATION** (delete whichever is not applicable).

**BUSINESS CK NO.:** .....

**PROVINCE IN WHICH BUSINESS IS SITUATED?** .....

**PHYSICAL ADDRESS:** .....

.....**POSTAL CODE:** .....

**POSTAL ADDRESS:** .....

.....**POSTAL CODE:** .....

**TEL NO.:** ..... **CELL. NO.:** .....

**FAX NO.:** ..... **.EMAIL:** .....

2. STATE TYPE OF REGISTRATION YOU HAVE:

- 1. TESTER FOR SINGLE PHASE: YES/NO TSP No.: .....
- 2. INSTALLATION ELECTRICIAN: YES/NO IE No.: .....
- 3. MASTER INSTALLATION ELECTRICIAN: YES/NO MIE No.: .....

3. IN CASES WHERE REGISTERED PERSONS ARE EMPLOYED FULL TIME, COMPLETE THE FOLLOWING FOR EACH REGISTERED PERSON EMPLOYED BY THE BUSINESS AND NOTIFY THE CHIEF INSPECTOR IN THE EVENT OF ANY CHANGES:

SURNAME: .....

FIRST NAMES: .....

ID NO.: .....

TYPE OF REGISTRATION: TSP/IE/MIE (Delete whichever is not applicable)

REGISTRATION NO.: ..... DATE ISSUED: .....

4. IN SUPPORT OF THE APPLICATION, PLEASE SUBMIT THE FOLLOWING:

- 1. A certified copy of the ID of each registered person;
- 2. a certified copy of the business registration number (Indicate CK No.);
- 3. a certified copy of the registration certificate (both sides); and
- 4. a certified copy of the accreditation certificate from the accreditation authority.

I hereby declare that the above particulars are, to the best of my knowledge and belief, correct.

Signature of applicant: ..... Date:.....

FOR OFFICE USE ONLY

Application: APPROVED/NOT APPROVED

Reason/s for decline:.....

Registration No.: ..... Renewal 31 March every year.

Date:.....



Annexure 2

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT NO. 85 OF 1993)

APPLICATION FOR REGISTRATION AS AN ELECTRIC FENCE INSTALLER

The Department of Labour  
Occupational Health and Safety  
Private Bag X117  
Pretoria  
0001

**R120,00**  
Affix uncanceled SA revenue stamp(s)

Surname (block letters).....

First names (block letters).....

Postal address..... Code.....

Telephone No. (W)..... (H).....

(Fax)..... (Cell).....

Date of birth ..... Place of birth.....

Identity number (immigration permit number).....

A certified copy of applicant's installation electrician or master installation electrician certificate (both sides) shall be attached.

Two clear identical unmounted photographs of 40 mm by 30 mm showing the face and shoulders of the applicant shall be submitted. One photograph shall be certified on the back as follows:

I certify this to be a true photograph of.....

.....  
Signature of Magistrate, Justice of the Peace or  
Commissioner of Oaths

.....  
Date

I hereby declare that the above particulars are, to the best of my knowledge and belief, correct.

Signature of applicant: ..... Date: .....

**SPECIMEN SIGNATURE OF APPLICANT**

Note - The specimen signatures should be the normal signature of the applicant and should **be** carefully completed. One specimen will be affixed to any certificate of registration that may be issued.

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