

## DEPARTMENT OF LABOUR

Government Notice. R: 1593

12 August 1988

### Electrical Machinery Regulations, 1988

The Minister of Manpower has, under section 35 of the Machinery and Occupational Safety Act, 1983 (Act 6 of 1983) made the regulations contained in the Schedule hereto.

#### SCHEDULE

##### 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 -

“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 regulations published by Government Notice 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;

“electric fence” means an electrified barrier against the trespass of persons or animals which consists of one or more bare conductors;

“electrical installation” means an electrical installation as defined in regulation 1 of the regulations published by Government Notice R 2270 of 11 October 1985;

“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;

“supplier” means a supplier as defined in regulation 1 of the regulations published by Government Notice R.2270 of 11 October 1985;

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

“the Act” means the Machinery and Occupational Safety Act, 1983 (Act 6 of 1983);

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

### **Safety equipment**

2. Without derogating from any specific duty imposed on employers or users of machinery by the Act, the employer or user shall provide free of charge and maintain in good condition insulated stands, trestles, mats or such other protective equipment as may be necessary to prevent accidents, for use by persons engaged in working on or in close proximity to live (live; alive) electrical machinery or dead electrical machinery which may become live.

### **Work on disconnected electrical machinery**

3. Without derogating from any specific duty imposed on employers or users of machinery by the Act, 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.

### **Notices**

4. Without derogating from any specific duty imposed on users of machinery by the Act, the user shall cause notices in both official languages to be exhibited within, and at all designated entrances to the premises, as the case may be, on which generating plant and transforming, switching or linking apparatus are situated, which notices -

(a) prohibit unauthorised persons from entering such premises;

(b) prohibit unauthorised 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 and their access doors can be locked or bolted and that only authorised persons are permitted to open them and work thereon.

### **Switch and transformer premises**

5. (1) The user shall cause enclosed premises housing switchgear and transformers -

(a) to be of ample size so as 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) where necessary 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 which are suitable for use on electrical machinery and which are in good working order: 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 the electrical machinery.

(2) No person other than a person authorised thereto by the user shall enter, or be required or permitted by the user to enter, premises housing switchgear or transformers unless all live conductors are insulated against inadvertent contact or are screened off: Provided that the person so authorised may be accompanied by any other person acting under his control.

### **Electrical control gear**

6. (1) The 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 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 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 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 user shall post a notice at switch 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 switch or control gear, warning against re-closing such switch or control gear.

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

## **Switchboards**

7. The 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 which have no uninsulated conductors accessible from the back;

(b) switchboards, the switchgear of which is of a totally enclosed construction;

(c) switchboards, the backs of 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 which can be safely and effectively maintained from the front and which have all parts accessible from the front.

## **Electrical machinery in hazardous locations**

8. (1) 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 36 of the Act.

(2) Every 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 inspection authority, 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 36 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.

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

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

(5) No person 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.

(6) Wherever there is a possibility of the formation of static electricity under working conditions, the 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 effectively prevent the formation of electric sparks.

(7) The user shall cause all electrical machinery to which this regulation applies to be examined and tested at intervals not exceeding two years by a person who is competent to express an opinion on the safety thereof.

(8) The person carrying out the examination referred to in subregulation (7) shall enter, sign and date the results of each such examination in a record book which shall be kept by the user for this purpose: 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.

### **Portable electric tools**

9. (1) No user shall permit the use of and no person shall use a portable electric tool the operating voltage of which exceeds 50 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 36 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 36 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 36 of the Act.

(3) No person 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 user shall maintain every portable electric tool, together with its flexible cord and plug, in a serviceable condition.

### **Portable electric lights**

10.(1) No person shall use a portable electric 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 person shall use a portable electric light in wet or damp conditions or in closely confined spaces inside metal 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 36 of the Act; or

(b) the operating voltage of the lamp does not exceed 50V, and where this electrical energy is derived from a transformer such transformer shall have separate windings.

## Electric fences

11.(1) No user shall install a fence energizer which delivers impulses of electrical energy to an electric fence which are not equal to or within the following values:

Peak value of voltage	10 kV
Maximum duration of impulse	50 ms
Minimum interval between impulses	0.75s
Maximum quantity of electricity per impulse	2.5 mC
Maximum energy discharge per impulse measured at a resistance of 500 ohms	8 J

(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 which 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 energizer 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 energizer which receives its energy from a battery charged by means of charging apparatus which receives power from an electric supply, the 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 is practicable mount the electrified wires or articles in such positions that persons cannot inadvertently come into contact therewith; and
- (b) display notices conspicuously, warning people that the property is protected by an electric fence.

## Inspection authorities

12.(1) The chief inspector may approve any organization which performs the prescribed functions with regard to the manufacture or testing of electrical machinery as an inspection authority.

(2) The chief inspector may require an organization contemplated in terms of subregulation (1) to submit to him such particulars of its technical equipment and resources, the extent of the qualifications and experience of its staff and such other matters as he may deem necessary.

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

## Earthing

13.(1) The 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;

(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; and

(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 wireway used for the mechanical protection of cables where such cables are not used in the secondary circuits of discharge luminaire 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 metal work 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 or other devices for fixing wireways and cables;

(vii) shades, reflectors and guards supported on lamp holders or discharge luminaires;

(viii) lamp caps;

(ix) metal parts of or screws in or through non-conducting material which are separated by such material 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 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 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 his satisfaction: Provided that the provision for the disconnection of the electrical energy shall not apply to premises owned by the State (including a provincial council, the South African Transport Services or the Department of Post and Telecommunications).

## Supports

14. The supplier or user shall cause the supports for power lines to be so designed as to provide the following minimum factors of safety.

	<b>Based on type-tested breaking strength</b>	<b>Based on calculated breaking strength</b>	<b>Based on modulus rupture</b>
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 telescopic 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 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

15. (1) The supplier or user shall cause -

(a) 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 r.m.s. 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 following table:

Max voltage for which insulation is designed kV r.m.s phase to phase cradles.	Minimum clearance in metres					
	Minimum safety clearance	Above ground outside townships	Above ground in townships	Above roads, railways, tramways	To communication lines, power lines,	To buildings and structures not 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
420	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 d.c.*	3.70	8.6	8.6	9.8	4.3	6.1

**\* Maximum voltage to earth for which insulation is designed.**

Provided that these figures are base on the assumption that clearances shall be determined for a minimum conductor temperature of 50°C and a swing angle corresponding to 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 clearance indicated in the table;

(b) the clearances of conductors and other wires over the normal high-water level of power lines crossing over water to be not 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; and

(c) the distance of any power line from an explosives magazine to comply with the requirements of the Explosives Act, 1956 (Act 26 of 1956).

(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 or user operating the power line.

(4) The supplier 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.

### **Protective supports**

16. The 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 unauthorised person from coming into dangerous proximity of the conductors by climbing such supports, and an inspector may require a user to protect a support of any other type similarly.

### **Insulators and fittings**

17. The supplier 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**

18. The supplier 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**

19. (1) No supplier 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 or user shall cause every part of -

(a) overhead service connections; and

(b) overhead service conductors from one building to another, to consist 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.

(3) No supplier 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.

### **Crossings**

20. (1) Where a power line crosses a proclaimed road, railway or tramway or a communication line proclaimed by the Postmaster General, the supplier or user shall cause the clearance to comply with the requirements of regulation 15 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 arching 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 r.m.s.; 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;

(f) the deviation from a right angle crossing over a communication line of the Department of Posts and Telecommunications or the South African Transport Services to be not greater than 30 degrees for lines with a voltage of 48 kV r.m.s. and above, and not greater than 45 degrees for lines below 48 kV r.m.s.; 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 or user shall cause every overhead service connection which crosses over bare communication lines of the Department of Posts and Telecommunications 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 shall not cross below bare communication lines.

### **Bare conductors on premises**

21. The 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.

## **Schemes to be submitted to the Postmaster General**

22. (1) The supplier shall, before commencing the installation of any distribution scheme or extension to a scheme, submit his complete proposals in duplicate to the Postmaster General and, where necessary to the General Manager of the South African Transport Services for the purpose of deciding by mutual agreement the methods of devices to be adopted by the supplier to avoid the creation of conditions on existing and projected communication and railway lines which may be dangerous to the public or to the employees concerned, and where such conditions can be avoided without material cost to either party by the amendment of either the projected plans of the supplier or the projected plans of the Department of Posts and Telecommunications or the South African Transport Services, as the case may be, such amendments shall be made: Provided that this subregulation shall not apply to service connections.

(2) If an agreement between the Postmaster General or the General Manager of the South African Transport Services and the supplier as contemplated in subregulation (1) cannot be reached, the dispute shall be referred to the chief inspector for a decision.

(3) Subject to the provisions of subregulation (4), the supplier shall pay all the costs arising from an agreement referred to in sub-regulation (1).

(4) In cases where an alteration to the design of an existing power line which has been erected in accordance with sub-regulations (1) and (2), or devices additional thereto, becomes necessary on account of representations made by the Postmaster General or by the General Manager of the South African Transport Services or by any other such body, such alteration shall be effected by the supplier at the expense of the body and whose representation the change has been brought about.

## **Offences and penalties**

23. Any person who contravenes or fails to comply with a provision of regulations 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21 or 22(1) shall be guilty of an offence and liable on conviction to a fine not exceeding R1 000 or to imprisonment for a period not exceeding six months and, in the case of a continuous offence, to an additional fine of R5 or to additional imprisonment of one day for each day on which the offence continues: Provided that the period of such additional imprisonment shall in no case exceed 90 days.

## **Withdrawal of regulations**

24. The following regulations are hereby withdrawn:

(a) Regulations C51 (3), C57 and C64, published under Government Notice R. 929 of 28 June 1963;

(b) regulations C52, C55 and C58, published under Government Notice R. 109 of 26 January 1973;

(c) regulations C56, C59, C60, C61, C62, C63, C65, C66, C67, C68, C69, C70 and C71, published under Government Notice R. 929 of 28 June 1963, as amended by Government Notice R. 1880 of 11 September 1981.

### **Short title**

25. These regulations shall be called the Electrical Machinery Regulations, 1988.

### **Incorporation of safety standards**

Under and by virtue of the powers vested in me by section 36 (1) of the Machinery and Occupational Safety Act, 1983 (Act 6 of 1983), I, Pieter Theunis Christiaan du Plessis, Minister of Manpower, hereby incorporate into the Electrical Machinery Regulations, 1988, the safety standards specified in the Schedule hereto.

P. T. C. DU PLESSIS,  
Minister of Manpower.

### **Schedule**

#### **1. Regulation 8(1)**

**South African Bureau of Standards**, code of practice SABS 0108: The classification of hazardous locations and the selection of electrical apparatus for use in such locations.

#### **2. Regulation 8(2)**

**South African Bureau of Standards**, standard specifications

SABS 314: Flameproof enclosures for electrical apparatus;

SABS 549: Intrinsically safe electrical apparatus;

SABS 969: Enclosures for electrical apparatus (Dust-ignition-proof or hose-proof or both);

SABS 970: Non-sparking electrical equipment for use in Class I, Division 2 locations;

SABS 1031: Type 'e' apparatus for use in flammable gas atmospheres;

SABS 1020: Electrical components for free-standing power-operated dispensing devices for flammable liquids;

SABS 0119: Reduction of explosive hazards by segregation, ventilation and pressurisation of electrical equipment;

### **British Standards, specifications**

B.S. 229: Flameproof enclosure of electrical apparatus;

B.S. 1259: Intrinsically safe electrical apparatus and circuits for use in explosive atmospheres;

B.S. 5501: Electrical apparatus for use in potentially explosive atmospheres, Parts, 1, 3, 4, 5, 6 and 7 (also respectively referred to as EN 50 014, 50 016, 50 017, 50 018, 50 019 and 50 020);

B.S. 4683: Electrical apparatus for explosive atmospheres Parts 2, 3 and 4;

B.S. 4533, Section 102, 51: Luminaires with type of protection N;

**British Approvals Service for Electrical Equipment** in Flammable Atmospheres

(BASEEFA), SFA standards for flameproof and equivalent equipment;

**Verband Deutscher Elektrotechniker** (VDE), specification VDE 0171: Construction and testing of electrical apparatus for use in explosive gas atmospheres for industries other than mining;

**European Committee for Electrotechnical Standardization**, specifications EN 50014 and 50016 to 50020: Electrical apparatus for use in potentially explosive atmospheres;

**Underwriters Laboratories** (UL) standards for-

- (a) explosion proof electrical equipment;
- (b) intrinsically safe electrical equipment; and
- (c) dust-ignition proof electrical equipment;

**National Fire Protection Association** (NFPA) standard No. 493 for intrinsically safe equipment in use in hazardous locations;

**Factory Mutual Research Corporation**, FM standard for intrinsically safe apparatus for use in Class I, Division 1 locations and for non-incentive apparatus for use in Class I Division 2 locations;

**Canadian Standards Association** (CSA), standards

C22.2 No. 30: Explosion proof enclosures for use in Class I hazardous locations;

C22.2 No. 25: Enclosures for use in Class II, Groups E, F and G hazardous locations;

**Standards Associations of Australia**, specification

AS 2480: Electrical equipment for explosive atmospheres: Flameproof enclosures - type of protection 'd'

### **3. Regulation 9(1)(a) and 10(2)(a)**

**South African Bureau of Standards**, standard specification SABS 767: Core balance earth leakage protection units.

### **4. Regulation 9(1)(b)**

**South African Bureau of Standards**, standard specification SABS 743: Low-voltage insulating transformers.

**5. Regulation 9(2)(b)**

**South African Bureau of Standards**, standard specification SABS 1157:

Double-insulated hand-held electric motor operated tools;

**International Commission On Rules For The Approval of Electrical Equipment (CEE)**, specification for Portable Motor Operated Tools, Publication 20;

**British Standards**, specification B.S. 2769: Hand-held electric motor operated tools.

**6. Regulations 15(1)(a) and 19(2)**

**South African Bureau of Standards**, specification SABS 150: Polyvinyl chloride (PVC)-insulated electric cables and flexible cords.