1970. No. 130 **[C]**

COAL AND OTHER MINES

Electricity

REGULATIONS, DATED 1ST JUNE 1970, MADE BY THE MINISTRY OF COMMERCE UNDER SECTIONS 13(2), 68(1) AND 120 OF THE MINES ACT (NORTHERN IRELAND) 1969.

WHEREAS in pursuance of Part I of Schedule 2 to the Mines Act (Northern Ireland) 1969(a) the Ministry of Commerce has published notice of its intention to make the following regulations and has not received any objection to the draft thereof in respect to which it is required to refer the draft regulations for inquiry and report:

NOW, THEREFORE, the Ministry of Commerce in exercise of the powers conferred on it by sections 13(2), 68(1) and 120 of the Mines Act (Northern Ireland) 1969 and of all other powers enabling it in that behalf, hereby makes the following regulations:—

PART I

GENERAL

Citation

1. These regulations may be cited as the Coal and Other Mines (Electricity) Regulations (Northern Ireland) 1970.

Application

2. These regulations shall apply to every mine of coal, stratified ironstone, shale or fireclay and in these regulations "mine" means such a mine.

Interpretation

3.—(1) In these regulations, unless the context otherwise requires, the following expressions have the meanings hereby respectively assigned to them, that is to say—

"the Act" means the Mines Act (Northern Ireland) 1969;

"circuit breaker" includes a fuse;

"concentric cable" means a cable in which an outer conductor is disposed around an inner conductor;

"electrical apparatus" includes electric cables and any part of any machinery, apparatus, or appliance being a part designed for the generation, conversion, storage, transmission or utilisation of electricity;

"flexible cable" means a cable which is designed to be movable while in use;

"incendive sparking" means, in relation to any electrical apparatus, sparking in such circumstances that inflammable gas present in the air outside the apparatus might be ignited directly or indirectly;

(a) 1969. c. 6 (N.I.)

"metallic covering" in relation to any cable means an iron or steel wire covering and any lead or other metallic sheath provided in addition thereto or an iron or steel pipe;

"mine" has the meaning assigned thereto in regulation 2;

"the Ministry" means the Ministry of Commerce;

"portable apparatus" includes any electrical apparatus that is designed to be moved while working.

(2) Without prejudice to section 151 of the Act, for purposes of these regulations anything for the time being certified or approved under the corresponding provision of the Mines and Quarries Act 1954(**b**) or regulations made thereunder shall be deemed to be certified or approved by the Ministry, unless the Ministry by notice published in the *Belfast Gazette* and otherwise brought to the notice of persons concerned in such manner as the Ministry thinks fit, directs that it shall not be so deemed:

Provided that the foregoing shall not affect the interpretation of the expression "approved by the Ministry" as used in regulation 7.

(3) Expressions to which meanings are assigned by the Act or by these regulations shall (unless the contrary intention appears) have the same meanings in any document issued under the provisions of these regulations.

Exemptions

4. If an inspector is satisfied that the application of any provision of these regulations is inappropriate in relation to any mine or part of a mine or is not requisite for safety in relation to any electrical apparatus therein, the Ministry may by notice served on the manager of that mine grant exemption from that provision in respect of that mine or part thereof or in respect of that apparatus, as the case may be.

Saving

5. Nothing in these regulations shall apply to any electrical apparatus which is not used and is not intended to be used as, and does not form and is not intended to form, part of the equipment of a mine.

PART II

MISCELLANEOUS PROVISIONS

Notice of introduction of electricity

6.—(1) Electrical apparatus shall not be installed below ground in any part of a mine being a part in which electrical apparatus is not already installed, unless the manager of the mine has served on the Ministry notice of the intention so to do in such form and accompanied by such particulars as may be specified by the Ministry, and the Ministry has not within thirty days of the service of that notice served a notice on the manager in relation to such installation in pursuance of sub-section (2) of section 68 of the Act.

(2) Nothing in this regulation shall apply—

(*a*) to the installation of electrical apparatus in any part of a mine, being a part in which the installation of such apparatus was lawful immediately before the commencement of the Act;

(*b*) to the installation of telephone or signalling apparatus, and for the purposes of this regulation no account shall be taken of such apparatus already installed.

(**b**) 2 & 3 El. 2. c. 70.

Plan of electrical apparatus

7. It shall be the duty of the manager of every mine in which there is installed below ground electrical apparatus, other than telephone or signalling apparatus, to keep at the office at the mine or at such other place as may be approved by the Ministry, plans, on the same scale as the plans of the workings in the mine so kept, showing the position of all such electrical apparatus other than portable apparatus and cables.

Main switchgear for cutting off electricity

8.—(1) There shall be provided at the surface at every mine in which there is installed below ground electrical apparatus, other than telephone or signalling apparatus, suitable switchgear for cutting off the supply of electricity therefrom.

(2) The manager of every such mine shall make and secure the efficient carrying out of arrangements whereby a competent person appointed by him for the purpose of operating such switchgear is in attendance at the surface at the mine whenever any cable below ground in the mine is live.

(3) There shall be provided effective means of telephonic communication or other equivalent means of transmitting speech between the place at which such switchgear is situate and a place at or near every such entrance below ground to every shaft or outlet as is regularly used for affording means of ingress and egress by persons employed in a part of the mine in which electrical apparatus is installed or a place at or near the main distributing centre (if any) for the part of the mine to which that entrance gives access. There shall be kept posted in a suitable position near such means of communication a notice in such characters as to be easily seen and read specifying how communication with the person in attendance at that switchgear is to be obtained.

Other means for cutting off electricity

9.—(1) There shall be provided in relation to every electrical circuit at every mine (whether at the surface or below ground) effective means suitably placed for cutting off the supply of electricity from that circuit as may be necessary to prevent danger, and without prejudice to the generality of the aforesaid such means shall be provided for cutting off the supply from any flexible cable at the apparatus by which it is connected to fixed cable.

(2) There shall be provided in relation to every such electrical circuit such effective means for cutting off the supply of electricity automatically from that circuit in the event of any fault occurring in any part of that circuit as may be necessary to prevent danger.

(3) There shall be provided in relation to every motor at a mine such switchgear that the supply of electricity can be entirely cut off from the motor and any starter therefor, being switchgear so placed as to be easily operated by the person operating the motor.

Cutting off electricity where inflammable gas is found

10.—(1) Where any person finds that at any place below ground in a mine an amount of inflammable gas is present in the general body of the air at that place exceeding one-and-a-quarter per cent. by volume or sees an indication of gas at that place on the lowered flame of a safety-lamp, then, without prejudice to the generality of the application of sections 79 and 80 of the Act, that person shall—

(*a*) forthwith cause the supply of electricity to be cut off from all electrical apparatus at that place, other than any telephone or signalling apparatus or any apparatus for detecting or measuring inflammable gas including ancillary apparatus operated by such apparatus or any electric safety-lamp, if the taking of those measures falls within the scope of his normal duties; or

(*b*) if not, forthwith report the matter to an official of the mine or a person whose normal duties include the taking of those measures.

(2) Any person to whom the presence of inflammable gas at that place is reported in pursuance of sub-paragraph (*b*) of the last preceding paragraph shall forthwith cause the supply of electricity to be cut off from all electrical apparatus at that place, other than any telephone or signalling apparatus or any apparatus for detecting or measuring inflammable gas including ancillary apparatus operated by such apparatus or any electric safety-lamp.

(3) After the supply of electricity has been cut off from electrical apparatus at that place in pursuance of sub-paragraph (*a*) of paragraph (1) or paragraph (2) of this regulation, no such supply shall be restored to that apparatus at that place until the senior official on duty at the mine, being satisfied that the amount of inflammable gas present in the general body of the air at that place does not exceed one-and-a-quarter per cent. by volume, so directs.

Restriction on use of high voltages

11. Electricity at a voltage exceeding six hundred and fifty shall not be applied to—

(*a*) any portable apparatus; or

(*b*) any motor at a mine rated at less than twenty horse-power; or

(*c*) the rotating parts of any apparatus.

Housing of apparatus

12.—(1) Wherever necessary to prevent danger therefrom or damage thereto electrical apparatus at the surface of any mine shall be installed in a room, compartment or box so constructed or treated as to be fire resisting.

(2) Wherever necessary to prevent danger therefrom or damage thereto any transformer or switchgear below ground in any mine shall be installed in a room, compartment or box which shall be of substantial construction and kept dry. Unless the apparatus so installed is so constructed, protected and worked as to obviate risk of fire, no inflammable material shall be used in the construction of any such room, compartment or box or of any of the fittings therein.

(3) No inflammable or explosive material shall be stored at any mine in any room, compartment or box containing any electrical apparatus or below ground in the vicinity of any electrical apparatus.

13.—(1) All parts of electrical apparatus that require attention and all handles for the operation of electrical apparatus shall be so placed that there is safe means of access thereto and adequate working space thereat.

(2) All such handles shall be kept free of obstruction and conveniently placed for operation.

Protection of apparatus

14. Every person doing any work which may result in such damage to any electrical apparatus at a mine that that apparatus might be a source of danger to persons employed thereat shall take such steps to protect it from such damage as may be appropriate.

Suitability of apparatus

15.—(1) No electrical apparatus shall be used at any mine unless it is of sufficient power or capacity to avoid dangerous overloading, and is protected against any danger arising out of such use.

(2) Wherever necessary to prevent danger, electrical apparatus at any mine shall be kept clean, dry and clear of obstruction.

Insulation

16.—(1) Any material used in any mine for the purpose of insulating any conductor shall be suitable having regard to the degree of insulation and mechanical strength required and the conditions of temperature and moisture to which it is likely to be subjected and to any means provided for its protection.

(2) Every conductor forming part of an electrical system, except the outer conductor of a concentric cable, shall be kept efficiently insulated from earth:

Provided that—

(*a*) in the case of a system with polyphase supply, the neutral point thereof may be connected at one place but no more to earth at the surface of the mine; and

(*b*) in the case of a system with single-phase or direct current supply, the mid-voltage point may be connected at one place but no more to earth at the surface of the mine.

(3) In relation to every electrical system efficient means shall be provided whereby an indication is given of any defect in the insulation thereof.

Earthing

17.—(1) There shall be connected to earth at the surface of the mine in such manner as will ensure immediate electrical discharge without danger—

(*a*) every metallic covering of any cable;

(*b*) the outer conductor of every concentric cable;

(*c*) every metallic part of any covering or container of, or mounting for, any other electrical apparatus; and

(*d*) any handle for the operation of any electrical apparatus:

Provided that the provisions of this paragraph shall not apply to a lamp-holder efficiently protected by a covering made of fire resisting material which is either insulated or earthed.

(2) Without prejudice to the generality of the last preceding paragraph, every earthing conductor installed for the purposes thereof shall have a conductivity throughout (including any joint) not less than half that of the conductor having the greatest current carrying capacity in relation to which it is provided and shall have a cross-sectional area not less than 0·022 square inches:

Provided that—

(*a*) in relation to a flexible cable by which electricity is supplied at a voltage not exceeding one hundred and twenty-five to portable apparatus, nothing in the preceding provisions of this paragraph shall require the earthing conductor to have a cross-sectional area greater than 0·01 square inches; and

(*b*) in relation to a flexible cable by which electricity is supplied to portable apparatus of capacity not exceeding three kilowatts at the surface of

a mine, being a cable comprising an earthing conductor, nothing in the preceding provisions of this paragraph shall require the earthing conductor to have a cross-sectional area greater than that of any one of the other conductors in that cable.

(3) Subject to the preceding provisions of this regulation and to the provisions of regulation 19, the metallic covering of any cable may be used as an earthing conductor.

(4) No switch or circuit breaker shall be placed in any earthing conductor.

(5) Nothing in this regulation shall apply to any apparatus in any circuit in which the voltage does not exceed two hundred and fifty direct current or one hundred and twenty-five alternating current, other than portable apparatus.

Cables

18.—(1) The provisions of this regulation shall apply to all electric cables at a mine other than—

(*a*) flexible cables for portable apparatus;

(*b*) telephone and signalling apparatus; and

(*c*) at the surface, other cables so placed or otherwise safeguarded as to prevent danger.

(2) Every conductor in every cable to which this regulation applies, except an earthed outer conductor of a concentric cable and a metallic covering of a cable used as an earthing conductor in accordance with the provisions of paragraph (3) of regulation 17, shall be covered with insulating material.

(3) Every cable to which this regulation applies shall be efficiently protected from mechanical damage and supported at such intervals and in such manner as to prevent damage thereto or danger.

(4) Every such cable used—

(*a*) for transmitting electricity at a voltage exceeding two hundred and fifty; or

(*b*) in any length of road below ground in which vehicles moved otherwise than by hand or conveyors are used; or

(*c*) at a place at which there may be a danger of igniting any inflammable material (including gas or coal dust);

shall be a cable protected by a metallic covering containing all the conductors forming part of that electrical system at that place:

Provided that in the case of a system in which direct current at a voltage not exceeding six hundred and fifty is used there may be separate cables each protected by a metallic covering, so however that such coverings below ground shall be bonded together at points not more than one hundred feet apart.

(5) In the case of every cable to which this regulation applies and which is protected by a metallic covering that covering shall be electrically continuous throughout and where necessary having regard to its position protected against corrosion. At any place at which there may be a danger of igniting inflammable material (including gas or coal dust) such metallic covering shall be so constructed as to minimise the risk of ignition of that material in the event of any fault in or leakage of current from a live conductor in the cable.

Flexible cables

19.—(1) No single-core flexible cable shall be used for supplying portable apparatus at any mine. Each conductor in a flexible cable shall be covered with insulating material and the conductor and insulating material shall be efficiently protected from damage.

(2) A metallic covering provided to protect a flexible cable from damage shall not be used as the sole earthing conductor in respect of that cable or any apparatus connected thereto, unless that cable is of a specification approved by the Ministry.

(3) No flexible cable shall be connected to any other electrical apparatus except by means of a properly constructed connector.

Switchgear and electrical joints and connections

20.—(1) All parts of switchgear and of electrical connections at every mine shall be of sufficient mechanical strength and current carrying capacity to prevent danger, in particular from rough usage.

(2) All live parts of such switchgear and connections shall be so enclosed or otherwise protected as to prevent a danger of persons accidentally coming into contact therewith, or from the deposit thereon of dust or other matter, or from water.

(3) Wherever any such switchgear or connection is at any place at which there may be a risk of igniting gas, coal dust or other material, all live parts thereof shall be so protected as to prevent external ignition thereof.

(4) Any material insulating any conductor in any cable shall be efficiently sealed at any point at which that conductor is connected to other apparatus where its insulating property might be diminished by moisture or otherwise.

(5) Wherever any cable protected by a metallic covering is connected to other apparatus that metallic covering shall be securely attached to that apparatus.

Transformers

21. In any transformer at a mine suitable provision shall be made to guard against danger arising from the charging of lower voltage components by contact with or leakage from higher voltage components.

Telephone and signalling apparatus

22. Adequate precautions shall be taken to prevent any telephone wire or signalling conductor wire coming into contact with any cable or other electrical apparatus.

23. The voltage in any circuit used for signalling (otherwise than by telephone) below ground in a mine shall not exceed twenty-five.

24.—(1) No electrical apparatus, other than apparatus of a type approved by the Ministry for the purposes of this regulation, shall be connected into any circuit used for signalling (whether by telephone or otherwise) wholly or partly in a mine or part of a mine in which the use of lamps or lights, other than permitted lights, is unlawful:

Provided that this paragraph shall not apply to apparatus used solely to regulate the movements of cages or carriages in a shaft or unwalkable outlet:

Provided also that telephones not of a type so approved may be connected into a part of such a circuit which is on the surface of the mine or in a part of the mine in which the use of lamps or lights, other than permitted lights, is not unlawful by means of a coupling unit of a type approved by the Ministry for the purpose.

(2) No source of current shall be used for operating electrical apparatus in any such circuit wholly or partly in a mine or part of a mine in which the use of lamps or lights, other than permitted lights, is unlawful except—

(*a*) for direct current signalling, a battery of three pint porous-pot Leclanché cells connected in simple series or a source of current approved by the Ministry for the purpose;

(*b*) for alternating current signalling, a transformer of a type approved by the Ministry for the purpose;

(*c*) for a magneto-call telephone of a type approved by the Ministry, a generator of a type specified in that approval.

(3) No part of any such circuit shall be connected to earth or to more than one source of current, except—

(*a*) that the same line wires may be used for the calling and speaking circuits of telephones;

(*b*) as provided in paragraph (5) of this regulation.

(4) Any magneto-call telephones connected into any such circuit shall be connected in parallel, and, if such telephones of different types are so connected, each instrument shall include a condenser of a type approved by the Ministry for the purpose connected in shunt with the calling bell.

(5) Any direct current bells or relays used in connection with any such circuit shall when connected in parallel be supplied from a single source of current or when connected in series be so supplied or supplied from two identical sources of current connected in opposition.

25. Contact makers used in telephone or signalling apparatus shall be so constructed as to prevent the accidental closing of the circuit.

Apparatus for detecting or measuring inflammable gas

26. No electrical apparatus for detecting or measuring inflammable gas including ancillary apparatus operated by such apparatus, other than apparatus of a type approved by the Ministry for the purposes of this regulation, shall be installed or used below ground in any part of a mine.

Apparatus for use where inflammable gas may occur

27.—(1) In any part of a mine below ground in which inflammable gas although not normally present is likely to occur in a quantity sufficient to indicate danger no electrical apparatus shall be used if there is in the normal working thereof a risk of incendive sparking therefrom.

(2) In any such part of a mine all rubbing contacts in any motor shall be so arranged or enclosed as to prevent incendive sparking.

Notices

28. It shall be the duty of the manager of every mine to secure that notices are kept posted in such positions and such characters as to be easily seen and read, that is to say—

(*a*) a notice prohibiting unauthorised persons from tampering with electrical apparatus, wherever such persons have access to any place in which such apparatus other than cables is installed;

(*b*) a notice containing directions upon the procedure in case of fire, at every place at which electrical apparatus, other than cables or telephone or signalling apparatus, is installed; and

(*c*) a notice containing directions upon the treatment of persons suffering from electric shock, wherever apparatus is installed from which a dangerous shock might be received.

Sealed with the Official Seal of the Ministry of Commerce for Northern Ireland this 1st day of June 1970 in the presence of

(L.S.) *J. H. Armstrong,*
Assistant Secretary.

EXPLANATORY NOTE

(*This note is not part of the regulations but is intended to indicate their general purport.*)

These regulations deal with the installation, use, housing, protection, insulation and earthing of electrical apparatus and with the cutting off of the supply of electricity in mines of coal, stratified ironstone, shale and fireclay. They also specify requirements in relation to apparatus used at such mines for telephones and signalling and for detection and measurement of inflammable gas and in relation to apparatus for use where inflammable gas may occur. The regulations are for general application but provision is made for exemptions to be granted in certain cases.