

- (c.) The lodgment of any matter likely to diminish the insulation, and of coaldust on or close to live parts, shall be prevented.
- (d.) All live parts shall be so protected or enclosed as to prevent accidental contact by persons, and danger from arcs or short circuits, fire, or water.
- (e.) Where there may be risk of igniting gas, coaldust, or other inflammable material, all parts shall be so protected as to prevent open sparking.

263. (1.) Properly constructed switch gear for cutting off the supply of current to the mine shall be provided at the surface of the mine, and during the time any cable is live a person authorized to operate the said switch gear shall be available within easy reach thereof. Lightning-arresters, properly adjusted and maintained, shall be provided where necessary to prevent danger.

(2.) Efficient means, suitably placed, shall be provided for cutting off all pressure from every part of a system, as may be necessary to prevent danger.

(3.) Such efficient means shall be provided in respect of each separate circuit for cutting off all pressure automatically from the circuit affected in the event of a fault, as may be necessary to prevent danger.

(4.) Every motor shall be controlled by switch gear for starting and stopping, so arranged as to cut off all pressure from the motor and from all apparatus in connection therewith, and so placed as to be easily worked by the person appointed to work the motor.

(5.) If a concentric system is used, no switch, fuse, or circuit-breaker shall be placed in the outer conductor, or in any conductor connected thereto, except that, if required, a reversing-switch may be inserted in the outer conductor at the place where the current is being used. Nevertheless, switches, fuses, or circuit-breakers may be used to break the connection with the generators or transformers supplying the electricity, provided that the connection of the outer conductor with the earthing-system shall not thereby be broken.

264. All cables, other than flexible cables for portable apparatus and signalling-wires, shall comply with the following requirements:—

- (a.) They shall be covered with insulating-material (except that the outer conductor of a concentric system may be bare). The lead sheath of lead-sheathed cables, and the iron or steel armouring of armoured cables, shall be of not less thickness respectively than is recommended by the British Engineering Standards Association.
- (b.) They shall be efficiently protected from mechanical damage, and supported at sufficiently frequent intervals and in such a manner as adequately to prevent danger and damage to the cables.
- (c.) Concentric cables, or two-core or multi-core cables protected by a metallic covering, or single-core cables protected by a metallic covering which shall contain all the conductors of the circuit, shall be used (i) where the pressure exceeds low pressure, (ii) where the roadway conveying the cables is also used for mechanical haulage, and (iii) where there may be risk from igniting gas, coaldust, or other inflammable material:

Provided that if the medium-pressure direct-current system is used—(i) two single-core cables protected by metallic coverings may be used for any circuit if the said metallic coverings are bonded together by earth conductors so placed that the distance between any two consecutive bonds is not greater than 100 ft. measured along either cable, and (ii) two single-core cables covered with insulating-material efficiently protected or otherwise than by a metallic covering may be used in gate-roads (except in gate-roads which are also used for mechanical haulage, or where there may be risk of igniting gas, coaldust, or other inflammable material) for the purpose of supplying portable apparatus.

- (d.) Cables unprotected by a metallic covering shall be properly secured by some non-conducting and readily breakable material to efficient insulators.
- (e.) The metallic covering of every cable shall be—(i) electrically continuous throughout; (ii) earthed, if it is required by Regulation 260 (1) to be earthed, by a connection to the earthing-system of not less conductivity than the same length of the said metallic covering; (iii) efficiently protected against corrosion where necessary; (iv) of a conductivity at all parts and at all joints at least equal to 50 per cent. of the conductivity of the largest conductor enclosed by the said metallic covering; and (v) where there may be risk of igniting gas, coaldust, or other inflammable material so constructed as to prevent as far as is reasonably practicable any fault or leakage

of current from the live conductors from causing open sparking:

Provided that where two single-core cables protected by metallic coverings bonded together in accordance with paragraph (c) of this regulation are used for a circuit the conductivity of each of the said metallic coverings at all parts and at all joints shall be at least equal to 25 per cent. of the conductivity of the conductor enclosed thereby.

- (f.) Cables and conductors where joined up to motors, transformers, switch gear, and other apparatus shall be installed so that (i) they are mechanically protected by securely attaching the metallic covering (if any) to the apparatus; and (ii) the insulating-material at each cable-end is efficiently sealed so as to prevent the diminution of its insulating properties. Where necessary to prevent abrasion or to secure gas-tightness there shall be properly constructed bushes.

265. (1.) Flexible cables for portable apparatus shall be two-core or multi-core, and covered with insulating-material which shall be efficiently protected from mechanical damage. If a flexible metallic covering be used either as the outer conductor of a concentric system or as a means of protection from mechanical damage, the same shall not alone be used to form an earth conductor for the portable apparatus.

(2.) Every flexible cable for portable apparatus shall be connected to the system and to the portable apparatus itself by a properly constructed connector.

(3.) At every point where flexible cables are joined to main cables a switch capable of entirely cutting off the pressure from the flexible cables shall be provided.

(4.) No lampholder shall be in metallic connection with the guard or other metal work of a portable lamp.

266. (1.) Every person appointed to work, supervise, or adjust any apparatus shall be competent for the work that he is set to do. No person except an electrician or a competent person acting under his supervision shall undertake any work where technical knowledge or experience is required in order adequately to avoid danger.

(2.) An electrician shall be appointed in writing by the manager to supervise the apparatus. If necessary for the proper fulfilment of the duties detailed in the succeeding paragraphs of this rule, the manager shall also appoint in writing an assistant or assistants to the electrician.

(3.) The electrician shall be in daily attendance at the mine. He shall be responsible for the fulfilment of the following duties, which shall be carried out by him or by an assistant or assistants duly appointed under subclause (2):

- (a) The thorough examination of all apparatus (including the testing of earth conductors and metallic coverings for continuity) as often as may be necessary to prevent danger; and (b) the examination and testing of all new apparatus, and of all apparatus re-erected in a new position in the mine before it is put into service in the new position: Provided that in the absence of the electrician for more than one day the manager shall appoint in writing an efficient substitute.

(4.) The electrician shall keep at the mine a log-book made up of daily log-sheets kept in the form prescribed by the Minister. The said log-book shall be produced at any time to an Inspector of Mines on his request.

(5.) Should there be a fault in any circuit the part affected shall be made dead without delay, and shall remain so until the fault has been remedied.

(6.) All apparatus shall be kept clear of obstruction and free from dust, dirt, and moisture as may be necessary to prevent danger. Inflammable or explosive material shall not be stored in any room, compartment, or box containing apparatus, or in the vicinity of apparatus.

(7.) Adequate precautions shall be taken by earthing or other suitable means to discharge electrically any conductor or apparatus or any adjacent apparatus if there is danger therefrom, before it is handled, and to prevent any conductor or apparatus from being accidentally or inadvertently electrically charged when persons are working thereon. While lamps are being changed the pressure shall be cut off; provided that this paragraph shall not apply to the cleaning of commutators and slip-rings working at low or medium pressures.

(8.) The person authorized to work an electrically driven coal-cutter or other portable machine shall not leave the machine while it is working, and shall, before leaving the working-place, ensure that the pressure is cut off from the flexible trailing cable which supplies such coal-cutter or other portable machine. Trailing cables shall not be dragged along by the machine when working.

(9.) Every flexible cable shall be examined periodically (if used with a portable machine, at least once in each shift by the person authorized to work the machine), and if found damaged or defective it shall forthwith be repaired or replaced by a spare cable in good and substantial repair. Such damaged or defective cable shall not be further used under-