
STATUTORY INSTRUMENTS

1993 No. 208

**The Coal and Other Safety-Lamp
Mines (Explosives) Regulations 1993**

PART V

SHOTFIRING PROCEDURES

Duty to ensure safe shotfiring operations

13. Every shotfirer and trainee shotfirer shall take all reasonable precautions to ensure that all stages of a shotfiring operation on which they are engaged are carried out in such a way as to ensure the safety of persons.

Stray electrical currents and voltages

14. The manager shall—

- (a) take all reasonable steps to identify any risks to safety present during shotfiring operations which arise out of any stray electrical currents or voltages; and
- (b) (having identified such risks) set up a system of shotfiring which will minimise them.

Shotfiring fumes

15. The manager shall—

- (a) take all reasonable steps to identify any risks to health or safety which arise out of toxic fumes produced by shotfiring operations; and
- (b) take effective measures either to eliminate those risks or (where it is not practicable to eliminate them) reduce them to the lowest extent reasonably practicable.

Priming cartridges

16.—(1) A person shall not prime or assist with priming cartridges unless he is a shotfirer or trainee shotfirer.

(2) A person shall not prime cartridges unless he is satisfied that—

- (a) all shotholes to be charged with the primed cartridges will be available for charging by the time that he has finished priming the cartridges; and
- (b) all the primed cartridges can be fired during his period of duty.

(3) A person who primes a cartridge at the place where it is to be used shall place it in a shothole before priming any further cartridges.

Use of priming station and security of primed cartridges

17.—(1) A person shall not prime cartridges away from the place where they are to be used unless—

- (a) he has been authorised in writing by the manager to do so; and
- (b) he does so at a suitable priming station designated by the manager for the purpose.

(2) A person who primes cartridges at a priming station shall—

- (a) carefully pack them into one or more containers; and
- (b) (in the case of a shotfirer, subject to paragraph (2) of regulation 33 or, in the case of a trainee shotfirer, subject to paragraph (3) of regulation 33) keep any such container secure until all the primed cartridges are used.

(3) A person shall not—

- (a) open a container of primed cartridges; or
- (b) handle a primed cartridge,

unless he is a shotfirer or trainee shotfirer.

Examination for general safety and tests for firedamp

18.—(1) Immediately before—

- (a) charging a shothole or round of shotholes; or
- (b) firing a shot or round of shots,

the person who is to fire the shot or round of shots shall make suitable tests for the presence of firedamp and (where appropriate) an examination for general safety.

(2) If any test carried out in accordance with paragraph (1) shows the presence of firedamp in a concentration of or greater than 1.25 per cent by volume or (where the estimated period of delay between the first and the last shot to be fired, calculated by reference to the markings on the detonators, exceeds 0.1 seconds) 0.8 per cent by volume, the person who made the test shall not proceed with charging or firing until the concentration of firedamp has been reduced below 1.25 per cent or, as the case may be, 0.8 per cent by volume; and when the concentration of firedamp cannot be so reduced, he shall—

- (a) inform the person having immediate control of the mining operations being carried on in the part of the mine where the relevant concentration was detected of that fact; and
- (b) take appropriate precautions to prevent danger arising from any shothole which he has charged but not fired.

Firedamp in the general body of the air

19.—(1) Where any shotfirer or any person having immediate control of any mining operations being carried on in any part of the mine finds or has reported to him the presence of firedamp in a concentration of or greater than 1.25 per cent by volume in the general body of the air he shall take all reasonable steps to ensure that—

- (a) the charging of shotholes or firing of shots ceases immediately at—

(i) the place where firedamp in the above concentration was found to be present, and

(ii) any part of the return side of that place which is within the same district or part of a mine as that place;

- (b) the person for the time being in charge of the mine is informed forthwith; and

- (c) if the concentration of firedamp in the general body of the air cannot be reduced below 1.25 per cent by volume, appropriate precautions are taken to prevent danger arising from any shothole situated at the place referred to in subparagraph (a)(i) of this paragraph which has been charged but not fired.
- (2) Where the person for the time being in charge of the mine has the presence of firedamp reported to him in accordance with paragraph (1)(b) he shall take all reasonable steps to ensure that—
 - (a) the charging of shotholes and the firing of shots are prohibited in any part of the mine ventilated by such air as has been found to contain firedamp in a concentration of or greater than 1.25 per cent by volume in its general body;
 - (b) any charging of shotholes or firing of shots which has ceased in accordance with paragraph (1)(a) or which has been prohibited in accordance with subparagraph (a) of this paragraph is not resumed or, as the case may be, does not take place until he has—
 - (i) satisfied himself that such resumption or taking place is safe, and
 - (ii) authorised such resumption or taking place; and
 - (c) the circumstances are reported to the manager.
- (3) The manager shall notify the Health and Safety Executive forthwith whenever the charging of shotholes or firing of shots ceases or is prohibited in accordance with this regulation.

Restrictions on the drilling and charging of shotholes

- 20.**—(1) Any person who drills a shothole shall ensure that it is not placed or drilled into any charge or socket remaining from a previous shot.
- (2) A person shall not charge a shothole unless it is safe to do so.
 - (3) A person shall not charge a shothole as part of a delay round unless—
 - (a) he inserts the primed cartridge first with the detonator at the back of the shothole; and
 - (b) he has allowed for suitable delay periods between the shots having regard to the circumstances of the particular case.
 - (4) A person shall not charge a shothole or different shotholes in a round with primed cartridges which contain explosives or detonators of a different type from those used in the remainder of the charge or round concerned.
 - (5) A person responsible for charging a shothole shall ensure that—
 - (a) where necessary, the back of the shothole is plugged with stemming material;
 - (b) the shothole is stemmed with a sufficient amount of suitable stemming material; and
 - (c) any tool inserted into a charged shothole is made of wood or of an anti-static material.

Removal of part of a charge from a charged shothole

- 21.** A person shall not remove any part of a charge from a charged shothole unless he is dealing with a misfire.

Persons who may carry out shotfiring operations

- 22.**—(1) Subject to paragraph (2), no person except a shotfirer or trainee shotfirer shall carry out shotfiring operations.
- (2) Nothing in—

- (a) regulation 10(2)(c) or paragraph (1) shall prevent not more than one person from inserting into a shothole any part of a charge which is not a primed cartridge when he does so under the close personal supervision of a shotfirer; or
 - (b) paragraph (1) shall prevent several persons from stemming shotholes when they do so under the supervision of a shotfirer.
- (3) The manager shall ensure that each shotfiring operation is carried out by or under the supervision of a single shotfirer.

Danger zones and withdrawal of persons

23.—(1) Before a shot or round of shots is fired, the shotfirer who is to fire the shot or round or supervise its firing shall—

- (a) identify the danger zone;
- (b) so far as is reasonably practicable, examine all parts of the danger zone; and
- (c) take all reasonable steps to ensure that—
 - (i) suitable sentries are posted or such fencing is erected as will prevent, so far as is practicable, persons from entering the danger zone,
 - (ii) no equipment or apparatus in the danger zone is rendered dangerous by the firing of a shot, and
 - (iii) subject to paragraph (2), all persons (other than himself and any trainee shotfirer who may be with him) are withdrawn from the danger zone.

(2) Nothing in paragraph (1)(c)(iii) shall prevent one other person from remaining with the shotfirer or trainee shotfirer concerned in a shaft or staple pit.

(3) A person shall not couple a shotfiring cable to a detonator circuit in a shaft or staple pit provided with winding apparatus which is not permanent manwinding apparatus unless—

- (a) the kibble is conveniently placed for persons in the shaft or staple pit to enter it; and
- (b) he has satisfied himself that the person operating the winding apparatus is ready to raise the kibble.

Sentry's duties

24. A person who has been posted under regulation 23(1)(c)(i) to act as a sentry in respect of a particular danger zone—

- (a) shall forbid all persons (except the shotfirer whose duty it was to ensure that he was so posted or any trainee shotfirer working under that shotfirer's close personal supervision) to enter that danger zone; and
- (b) shall not leave his post until the particular person who posted him to it has personally directed him to do so.

Duty to comply with sentry's orders and notices

25. A person shall not—

- (a) pass a sentry who has forbidden him to enter a danger zone in accordance with regulation 24(a); or
- (b) pass a fence erected in accordance with regulation 23(1)(c)(i) unless he has the permission of the person firing the shot.

Shotfiring cable

26.—(1) A person shall not use shotfiring cable other than for firing shots.

(2) A person using any shotfiring cable shall take all reasonable steps to ensure that the cable is safe for use.

Steps to be taken before firing a shot or round of shots

27. A person shall not fire a shot or round of shots unless—

- (a) where transformer coupled electric detonators are not to be used) he has—
 - (i) checked that all the detonators concerned are connected in series,
 - (ii) connected the detonator circuit to the shotfiring cable,
 - (iii) withdrawn himself and any person with him from the danger zone, and
 - (iv) tested the circuit for continuity and electrical resistance with an ohmmeter suitable for the purpose or the exploder testing circuit; or
- (b) (where transformer coupled electric detonators are to be used) he has—
 - (i) checked that the primary looping wire has been threaded through all the toroids,
 - (ii) connected the primary looping wire to the shotfiring cable,
 - (iii) withdrawn himself and any person with him from the danger zone,
 - (iv) checked the circuit for electrical impedance and tested the primary looping wire and the shotfiring cable for continuity with the exploder testing circuit; and
- (c) (in either case)—
 - (i) he has determined that the electrical resistance or impedance of the circuit is such as to make a misfire unlikely, and
 - (ii) it is safe to do so.

Operation of exploder

28. A shotfirer or trainee shotfirer—

- (a) shall not place the removable handle or key in position in the exploder until he is about to use the exploder to test the circuit or fire a shot; and
- (b) shall withdraw the removable handle or key from the exploder immediately after the operation of the exploder or an unsatisfactory test on the firing circuit.

Maximum number of shots

29.—(1) The manager shall—

- (a) give each shotfirer written notice of the maximum number of shots he may fire or have fired during his period of duty; and
- (b) keep an up-to-date copy of that notice at the office of the mine.

(2) The maximum number of shots notified in accordance with paragraph (1)(a) shall in each case be one which is consistent with the requirements of safety.

(3) If, pursuant to paragraph (1)(a), the manager of a coal mine gives any shotfirer who, for the duration of his period of duty, is also a deputy assigned to a district written notice that that shotfirer may fire or have fired more than 10 shots during that period, the manager shall, as soon as practicable thereafter, give notice thereof, in a suitable form, to the Health and Safety Executive.

(4) In paragraph (3), “deputy” has the same meaning as in regulation 33(1) of the Coal and Other Mines (Managers and Officials) Regulations 1956(1).

Prohibited shots

30.—(1) A person shall not fire a shot in the roof of any longwall working between the coal face and the waste, except—

- (a) in accordance with suitable rules made by the manager;
- (b) with the authority of the person for the time being in charge of the mine;
- (c) for the purpose of providing access to machinery or grading through geological disturbances; and
- (d) where the shot is not in the waste of that longwall working and it is not foreseeable that it will break into that waste.

(2) A person shall not fire a detonator or primed cartridge unless it forms part of a charge in a shothole.

Precautions after firing

31.—(1) Subject to regulation 33(2), in the case where a shot or round of shots has been fired at a coal mine, the shotfirer who fired the shot or round or who supervised its firing shall personally examine the area affected by the blast for the purpose of ensuring that it is safe for work to be resumed.

(2) In the case where a shot or round of shots has been fired at a safety-lamp mine shotfirer (whether or not that shotfirer fired the shot or round or supervised its firing) personally examines the area affected by the blast for the purpose of ensuring that it is safe for work to be resumed.

(3) A shotfirer shall not make an examination in accordance with paragraph (1) or (2) until the appropriate period specified below has elapsed—

- (a) 5 minutes, where fewer than 7 shots have been fired; and
- (b) 10 minutes, where 7 or more shots have been fired.

Steps to be taken in the event of a misfire

32.—(1) Subject to regulation 33(2), in the event of a misfire the shotfirer in charge of the shot shall—

- (a) take whatever steps are necessary to determine the cause of and deal with the misfire; and
- (b) report the misfire to the manager.

(2) The manager shall—

- (a) investigate the circumstances of any misfire reported to him pursuant to paragraph (1)(b); and
- (b) (following any such investigation) ensure, so far as is reasonably practicable, that no further misfire occurs.

(3) No person shall attempt to recover a misfired charge from a shothole by—

- (a) using a tool to remove the charge or the mineral directly round it; or
- (b) pulling forcibly on the detonator leads.

(1) [S.I. 1956/1758](#), to which there are amendments not relevant to these Regulations.

Additional duties of shotfirers

33.—(1) Subject to paragraph (2), a shotfirer shall ensure that all shotholes charged and all primed cartridges held by him or by other persons acting under his supervision are fired before the end of his period of duty.

(2) Where a shotfirer is prevented by reasons beyond his control from complying with paragraph (1), regulation 17(2)(b), regulation 31(1) or regulation 32(1), that shotfirer shall report the matter either to the person under whose direction he is working or to a person senior to that person, who shall either carry out the relevant duty himself or require it to be carried out by another shotfirer, in which case that other shotfirer shall be obliged to comply with the duty concerned.

(3) Where a trainee shotfirer is prevented by reasons beyond his control from complying with regulation 17(2)(b), the duty imposed upon him by that provision shall be carried out by the shotfirer under whose close personal supervision he is working.

Shotfirer's records

34. Every shotfirer shall in respect of each period of duty that he works make a record of—

- (a) every shot fired by him or under his supervision, including the weight of explosives and number of detonators used;
- (b) any misfire which occurred in respect of a shot intended to be fired by him or under his supervision;
- (c) any steps taken by him pursuant to regulation 32(1)(a); and
- (d) any report made by him pursuant to regulation 33(2).