

# MANUFACTURE AND STORAGE OF EXPLOSIVES

## Manufacture and Storage of Explosives Regulations 2005

### DRAFT APPROVED CODE OF PRACTICE, REGULATIONS AND GUIDANCE

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## **INTRODUCTION**

### **What is this publication about?**

1. This publication provides guidance on how to comply with the Manufacture and Storage of Explosives Regulations 2004 (MSER) which cover the manufacture, storage and handling of all explosives, including:

- blasting explosives;
- propellants;
- detonators and detonating cord;
- fireworks and other pyrotechnic articles;
- ammunition;
- and other explosive articles such as airbags and seat belt pre-tensioners.

2. The activities covered by MSER include the manufacture of explosives and intermediate products for on-site mixing and storage.

3. Also covered are handling operations that are not in themselves considered to be "manufacture". These include:

- fusing fireworks;
- assembling fireworks displays from components;
- filling shotgun cartridges and other cartridges for small arms.

4. The Regulations do not cover the use or off-site transport of explosives.

### **Who is this publication for?**

5. This publication contains material that is relevant to all everyone involved in any of the activities described in paragraphs 1 to 3.

### **Other legislation**

6. There are also other general health and safety regulations which apply to the storage, handling and manufacture of explosives. This document gives additional guidance where there are particular issues which need to be considered; for example in selecting work or personal protective equipment.

## Note on terminology

7. The following terms are used in this document:

'communication' - the process of deflagration or detonation progressing to adjacent or nearby explosives;

'deflagration' - exothermic chemical decomposition of a material in which the reaction front advances into the unreacted material at less than the speed of sound;

'detonation' - a chemical reaction that progresses through an explosive at a rate exceeding the speed of sound in the reaction zone;

'explosives area' - any area, which may be outdoors or within a building, where explosives are stored and processed;

'explosives building' any building in which explosives are stored or processed;

'explosives site' - the whole area covered by the establishment. This is likely to be the same as the area covered by the explosives licence;

[Hazard type - short definition to be added]

'Initiation' - the act of causing an explosive material to deflagrate or detonate;

'ISO container' - the term ISO container is used to avoid confusion with the general usage of 'container' (meaning a receptacle). Unless the context indicates otherwise, this term includes other similar metal storage units;

'propagation' - the process of deflagration or detonation progressing through the mass of material in a container or stack;

'pyrotechnic' - the term pyrotechnic applies to fireworks plus other items such as flares, smoke signals and flash cartridges. The term 'firework' is only used in this document where a requirement applies only to fireworks and not to pyrotechnic articles.

'reasonably practicable' - to carry out a duty 'as far as reasonably practicable' means that the degree of risk in a particular activity or environment can be balanced against the time, trouble, cost and physical difficulty of taking measures to avoid the risk. If these are so disproportionate to the risk that it would be quite unreasonable for the people concerned to have to incur them to prevent it, they are not obliged to do so. The greater the risk, the more likely it is that it is reasonable to go to very substantial expense, trouble and invention to reduce it. But if the consequences and the extent of a risk were small, insistence on great expense

would not be considered reasonable. It is important to remember that the size or financial position of the employer are *not* taken into account; and

'storage area' any area where explosives are stored either on a short or long-term basis.

Propagation?

Communication?

Need to consider whether to have a glossary

## **PART I**

### **INTRODUCTION**

#### **Regulation 1 Citation and commencement**

1.—(1) These Regulations may be cited as the Manufacture and Storage of Explosives Regulations 2004 and, except as provided by paragraph (2), shall come into force on .

(2) The repeal by these Regulations of sections 40(8) and 103 of the 1875 Act comes into force only with the coming into force of the repeal of section 32 of that Act by the Fireworks Act 2003<sup>(a)</sup>.

#### **Regulation 2 Interpretation**

2.—(1) In these Regulations —

“the 1875 Act” means the Explosives Act 1875<sup>(b)</sup>;

“the 1974 Act” means the Health and Safety at Work etc. Act 1974;

“ammonium nitrate blasting intermediate” means non-sensitised mixtures of, primarily, ammonium nitrate and other substances which are not themselves explosive, such as oxidisers and fuels, intended to produce a blasting explosive only after further processing prior to use and classified in accordance with the United Nations Recommendations as falling within Class 5.1;

“black powder” means an intimate mixture, with or without sulphur, of charcoal or other carbon with potassium nitrate or sodium nitrate, whether the mixture is in meal, granular, compressed or pelletised form, being an explosive substance allocated in accordance with the United Nations Recommendations the U.N. nos. 0027 or 0028;

“centre point”, in relation to a store or a building, means the centre point of the store or building determined as far as is reasonably practicable;

“Class 1” means Class 1 in respect of explosives or the classification of dangerous goods as set out in the United Nations Recommendations;

“desensitised explosive” means —

(a) a solid explosive substance which has been wetted with water, alcohol or diluted with one or more other substances; or

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<sup>(a)</sup> 2003 c.22.

<sup>(b)</sup> 1875 c.17 (38 & 39 Vict.); relevant amending instruments are S.I.1974/1885 and 1987/52.

(b) a liquid explosive substance which has been dissolved or suspended in water or one or more other substances,

to form a homogeneous mixture so as to suppress its explosive properties and which, without that treatment, would be classified in accordance with the United Nations Recommendations as falling within Class 1;

“disposes”, in relation to explosives and explosive-contaminated items, means destroying the explosives or explosive-contaminated items or otherwise rendering them harmless;

“the Executive” means the Health and Safety Executive;

“explosive” means —

(a) any explosive article or explosive substance which would —

(i) if packaged for transport, be classified in accordance with the United Nations Recommendations as falling within Class 1; or

(ii) be classified in accordance with the United Nations Recommendations as —

(aa) being unduly sensitive or so reactive as to be subject to spontaneous reaction and accordingly too dangerous to transport, and

(bb) falling within Class 1; or

(b) a desensitised explosive,

but it does not include an explosive substance produced as part of a manufacturing process which thereafter reprocesses it in order to produce a substance or preparation which is not an explosive substance;

“explosive article” means an article containing one or more explosive substances;

“explosive substance” means a substance or preparation, not including a substance in a gaseous form or in the form of vapour, which is —

(a) capable by chemical reaction in itself of producing gas at such a temperature and pressure and at such a speed as could cause damage to surroundings; or

(b) designed to produce an effect by heat, light, sound, gas or smoke, or a combination of these as a result of a non-detonative, self-sustaining, exothermic chemical reaction;

“firearm” has the same meaning as it is given in section 57(1) of the Firearms Act 1968<sup>(a)</sup>;

“fireworks” means the explosive articles allocated in accordance with the United Nations Recommendations any of the U.N. nos. 0333 to 0337;

“harbour” means a harbour which is within the jurisdiction of a harbour authority, and includes —

(a) the areas of water within the jurisdiction of that harbour authority; and

(b) land within the jurisdiction of, or occupied by, the harbour authority and used in connection with the loading and unloading of ships,

but does not include the areas of water which are within the jurisdiction not only of the harbour authority but also another harbour authority and which are used primarily by ships using berths within the harbour of that other harbour authority;

“harbour authority” has the same meaning as in the Harbours Act 1964<sup>(b)</sup>;

“hazard type” means any of hazard type 1 explosive, hazard type 2 explosive, hazard type 3 explosive or hazard type 4 explosive;

“hazard type 1 explosive” means an explosive which, as a result of, or as a result of any effect of, the conditions of its storage or process of manufacture, has a mass explosion hazard;

“hazard type 2 explosive” means an explosive which, as a result of, or as a result of any effect of, the conditions of its storage or process of manufacture, has a serious projectile hazard but does not have a mass explosion hazard;

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<sup>(a)</sup> 1968 c.27.

<sup>(b)</sup> 1964 c.40; “harbour authority” is defined in section 57(1).

“hazard type 3 explosive” means an explosive which, as a result of, or as a result of any effect of, the conditions of its storage or process of manufacture, has a fire hazard and either a minor blast hazard or a minor projectile hazard, or both, but does not have a mass explosion hazard;

“hazard type 4 explosive” means an explosive which, as a result of, or as a result of any effect of, the conditions of its storage or process of manufacture, has a fire or slight explosion hazard, or both, with only local effect;

“headquarters” means a headquarters for the time being specified in Schedule 2 to the Visiting Forces and International Headquarters (Application of Law) Order 1999<sup>(a)</sup>;

“Her Majesty's Forces” means any of the naval, military or air forces of the Crown, whether raised inside or outside the United Kingdom and whether any such force is a regular, auxiliary or reserve force, and includes any civilian employee of the Ministry of Defence attached to those forces;

“licence” means a licence for the manufacture or storage of explosives granted under regulation 13 and includes a varied licence;

“licensee” means a person who has been granted a licence under regulation 13 and includes a person to whom a licence is transferred and a person treated under regulation 21 as being licensed;

“licensing authority” has the meaning assigned to it by Schedule 1;

“local authority” means in relation to —

- (a) the City of London, the Common Council for the City of London;
- (b) an area in the rest of London, the London Borough Council for that area;
- (c) an area where there is a fire and civil defence authority, that authority;
- (d) the Isles of Scilly, the Council of the Isles of Scilly;
- (e) an area in the rest of England, the county council for that area or where there is no county council for that area, the district council for that area;
- (f) an area in Scotland, the council for the local government area; and
- (g) an area in Wales, the county council or the county borough council for that area;

“manufacture” includes —

- (a) in relation to explosive articles, their repair, modification, disassembly or unmaking;
- (b) in relation to explosive substances, their reprocessing, modification or adaptation;

but it does not include the packing, unpacking, re-packing, labelling, testing of explosives or the division of an amount of explosives stored in bulk into smaller amounts and the placing of those smaller amounts into containers;

“mine” means an excavation or system of excavations, including all such excavations to which a common system of ventilation is provided, made for the purpose of, or in connection with, the getting, wholly or substantially by means involving the employment of persons below ground, of minerals (whether in their natural state or in solution or suspension) or products of minerals;

“non-sensitised” means giving a negative test result when subjected to Test Series 8 of the Manual of Tests and Criteria, third edition<sup>(b)</sup>, supporting the United Nations Recommendations;

“percussion caps” means items intended for use in small arms ammunition allocated in accordance with the United Nations Recommendations the UN nos. 0044, 0377 or 0378;

“police force”, for the purposes of regulation 3(4)(d) and (6)(b) and regulation 27(6), includes the police force known as the British Transport Police Force<sup>(c)</sup> and the special constables

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<sup>(a)</sup> S.I. 1999/1736.

<sup>(b)</sup> ISBN 92 - 1 - 1390680.

<sup>(c)</sup> This name is given by Article 2(b) of the British Transport Police Force Scheme 1963, which was approved by order of the Minister of Transport in S.I.1964/1456, amended by S.I.1992/364 and 1994/609.



appointed as special constables under section 3 of the Special Constables Act 1923<sup>(a)</sup> on the nomination of the United Kingdom Atomic Energy Authority<sup>(b)</sup>;

“preparation” means a mixture of two or more substances or a solution of any substance or substances;

“propellant” means a deflagrating explosive used as a propellant in firearms;

“public consultation zone” means the area around the store or proposed store, or the building where the manufacture of explosives takes place or is proposed to take place, which, from the centre point of the store or building, has a radius equivalent to double the greatest separation distance required by virtue of these Regulations to apply in the case of that store or building;

“pyrotechnic” means an explosive article or substance of a kind designed to produce an effect by heat, light, sound, gas or smoke, or a combination of any of these, as a result of non-detonative, self-sustaining, exothermic chemical reactions;

“quarry” has the meaning assigned to it by regulation 3 of the Quarries Regulations 1999<sup>(c)</sup>;

“registered” in relation to a person, means a person registered in respect of the storage of explosives under regulation 11 and includes a person treated under regulation 21 as being registered;

“registration” save in regulation 22 and Schedule 4 means registration under regulation 11 and

“certificate of registration” means a certificate issued under regulation 11(3);

“separation distance” means the distance between the store or the building in which explosives are, or are to be, manufactured and a building, or other place in or at which people are or are likely to be present either all the time or from time to time;

“ship” includes every description of vessel used in navigation;

“shooters’ powder” means —

(a) black powder,

(b) smokeless powder, or

(c) any other substance or preparation based on potassium nitrate or nitro cellulose, whether in powder, pelletised or granular form, used as a propellant;

“shot firing charge” means a charge used in shotfiring operations;

“site” means the whole area under the control of the same person and, for these purposes —

(a) all places adjoining each other under the control of the same person shall be treated as a whole area; and

(b) two or more areas under the control of the same person separated only by a road, railway or inland waterway shall be treated as a whole area;

“small arms ammunition” means the explosive articles allocated in accordance with the United Nations Recommendations the U.N. nos. 0012, 0014, 0055, 0327, 0328, 0338, 0339 or 0379 which are intended exclusively for use in small arms;

“smokeless powder” means an explosive substance allocated in accordance with the United Nations Recommendations the U.N. nos. 0160 or 0161;

“a store” means a building, enclosed area or metal structure in which explosives are, or are to be, stored;

“substance” means any natural or artificial substance whether in solid or liquid form or in the form of a gas or vapour;

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<sup>(a)</sup> 1923 c.11.

<sup>(b)</sup> The United Kingdom Atomic Energy Authority nominates persons to be special constables under section 3 of the Special Constables Act 1923 (c.11) as extended by paragraph 1 of the second Schedule to the Emergency Laws (Miscellaneous Provisions) Act 1947 (c.10), Schedule 3 to the Atomic Energy Authority Act 1954 (c.32) and Schedule 1, paragraph 4, to the Nuclear Installations Act 1965 (.57).

<sup>(c)</sup> S.I. 1999/2024.

“U.N. no.” means United Nations Serial Number, that is to say one of the four-digit numbers devised by the United Nations as a means of identification of types of explosives in accordance with the United Nations Recommendations;

“United Nations Recommendations” means the United Nations Recommendations on the Transport of Dangerous Goods (based on those originally prepared by the United Nations Committee of Experts on the Transport of Dangerous Goods considered by the Economic and Social Committee of Experts at its twenty-third session (Resolution 645G (XXIII) of 26 April 1957))<sup>(a)</sup> as revised or reissued from time to time;

“visiting force” has the same meaning as it does for the purposes of any provision of the Visiting Forces Act 1952<sup>(b)</sup>;

“water-based”, in relation to explosives, means explosives which are based on water and ammonium nitrate and allocated in accordance with the United Nations Recommendations the U.N. no. 0241;

and related expressions shall be construed accordingly.

(2) For the purposes of these Regulations, and subject to regulation 3(7), the manufacture or storage of ammonium nitrate blasting intermediate shall be deemed to be the manufacture or storage of an explosive.

(3) For the purposes of measuring of any distance required to be a separation distance by virtue of these Regulations, the distance to be measured shall be the horizontal distance between the outside edge of the store or the building in which the explosives are, or are to be, manufactured and the nearest point of the building or other place which the separation distance applies to.

(4) Any reference in these Regulations to the quantity of an explosive shall be construed as a reference to the net mass of explosive substance and, in the case of any pyrotechnic article, the net mass of the explosive shall, for the purposes of these Regulations, be deemed to be one quarter of the gross mass of the pyrotechnic article or, where the manufacturer, importer or supplier specifies a different net mass amount on the pyrotechnic article, its packaging or a document accompanying the pyrotechnic article, that amount.

(5) For the purposes of these Regulations and subject to paragraph (6), “storage” in relation to explosives means their possession for any period after their manufacture, save for —

- (a) any period during which they are being prepared at any place for use at that place; and
- (b) any period during which they are being transported beyond the place where they are stored.

(6) Subject to paragraph (7), where, during any transport of any explosive beyond the place where it is stored, that explosive is, or is to be, kept at any place for more than twenty-four hours, that keeping shall be treated as storage within the meaning of these Regulations and the provisions of these Regulations shall apply to that keeping accordingly, notwithstanding any application of the provisions of the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2004<sup>(c)</sup> to that transporting.

(7) Paragraph (6) shall not apply to explosives in respect of which there is in existence an explosives licence granted under regulation 36(1) of the Dangerous Substances in Harbour Areas Regulations 1987<sup>(d)</sup>.

(8) The performance of any function given to the chief officer of police under these Regulations may be delegated by him, to such an extent and subject to such conditions as he may specify —

- (a) to a member of the police force in respect of which he is the chief officer of police,
- (b) to a person employed to assist that police force as mentioned in section 15 of the Police Act 1996<sup>(e)</sup> (civilian employees), or

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<sup>(a)</sup> Current edition (1997): ISBN 92-1-139057 5.

<sup>(b)</sup> 1952 c.67.

<sup>(c)</sup> S.I. 2004/568.

<sup>(d)</sup> S.I. 1987/37, to which there are amendments not relevant to these Regulations.

<sup>(e)</sup> 1996 c.16; section 15 is amended by the Greater London Authority Act 1999 (c.29) section 325 and Schedule 27, paragraph 74(1) to (4).

(c) to a person employed or appointed in relation to that police force as mentioned in section 9 of the Police (Scotland) Act 1967<sup>(a)</sup> (civilian employees),  
and any such delegation shall be made in writing by that chief officer of police.

(9) For the purposes of these Regulations, “chief officer of police” in relation to an area, means the chief officer of police for that area and includes a member of a police force to whom the performance of any of his functions under these Regulations has been delegated pursuant to paragraph (8).

## Guidance

### *‘Hazard Type’*

#### *Hazard Type*

8. The quantity of explosive which may be kept without the need to hold a licence or to register depends on the Hazard Type. Definitions of the hazard types are given in regulation 2 but are repeated here for ease of reference, together with (in *italics*) additional explanatory information:

- *Hazard Type 1: an explosive which, as a result of, or as a result of any effect of, the conditions of its storage or process of manufacture, has a mass explosion hazard (a mass explosion is one in which the entire body of explosives explodes as one);*
- *Hazard Type 2: an explosive which, as a result of, or as a result of any effect of, the conditions of its storage or process of manufacture, has a serious projectile hazard but does not have a mass explosion hazard;*
- *Hazard Type 3: an explosive which, as a result of, or as a result of any effect of, the conditions of its storage or process of manufacture, has a fire hazard and either a minor blast hazard or a minor projection hazard, or both, but does not have a mass explosion hazard (ie those explosives which give rise to considerable radiant heat or which burn to produce a minor blast or projection hazard); and*
- *Hazard Type 4: an explosive which, as a result of, or as a result of any effect of, the conditions of its storage or process of manufacture, has a fire or slight explosion hazard, or both, with only local effect (ie those explosives which present only a low hazard in the event of ignition or initiation, where no significant blast or projection of fragments of appreciable size or range is expected).*

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<sup>(a)</sup> 1967 c.77; section 9 is amended by the Police and Magistrates’ Courts Act 1994 (c.29), section 49, and by the Criminal Justice (Scotland) Act 2003 (asp 7), section 76(1) to (3).

9. It should be noted that in broad terms the Hazard Types parallel the UN hazard divisions used for classification for transport purposes. However, it should be noted that classification refers to the explosives as packaged for transport. If explosives are kept other than in their classified packages, it cannot be assumed that the hazard they present remains the same. Further guidance on Hazard Type, including information on determining the hazard type rating, is given in Annex 1

**'licensing authority'**

10. The relevant licensing authority will depend on the type of licence and the location of the site. Guidance on the demarcation of responsibility for licensing is given in the guidance to regulation 12 (Applications for licences) (see paragraph 511).

**'manufacture'**

11. It should be noted that the definition specifies certain activities that are regarded as manufacture. However, manufacture is not limited to these activities but would include any activity where the process undertaken changes the nature of the substance or article. This includes processes where explosive substances or explosives are made or assembled, or unmade or disassembled.

12. Ancillary activities such as the packing of fireworks or explosive articles into boxes, or the marking of explosive articles do not fall within the definition of manufacture. Where these activities alone are undertaken then there is no requirement to hold a licence under regulation 9. However, such activities fall within the scope of the Regulations as a whole and of the safety requirements set out in regulations 4 to 8.

**'net mass'**

13. The terms 'net explosive content' and 'net explosive quantity' are commonly used in the industry to refer to the weight of the explosive contained within an article (ie less packaging, casings etc). Although these terms are commonly understood to refer to mass there is scope for differing interpretations of 'content' and 'quantity' in that these could be taken to refer to volume. The term 'net mass' is used for the sole reason of avoiding any scope for confusion or misinterpretation.

14. For fireworks the net mass should be assumed to be one quarter of the gross weight of the fireworks unless the manufacturer has provided more specific information.

15. It should be noted that a different definition of net mass is used in the Packaging of Explosives for

Carriage Regulations 1991 for the purposes of identifying the weight of explosives contained in packaging for transport.

### ***Ammonium nitrate and other emulsions***

16. Regulation 2(2) extends the scope of the Regulations so that the preparation and storage of ammonium nitrate blasting intermediates are treated as if they were the manufacture or storage of an explosive. Therefore the safety and licensing requirements apply. It is important to stress that regulation 2(2) only extends the application of the Regulations on the manufacture and storage of explosives and has no bearing on the application of either the regulations on the carriage of explosives or the Control of Major Accident Hazards Regulations 1999.

### ***Person***

17. The term 'person' is used in a number of these Regulations. 'Person' means a legal person which may be an individual or certain types of organisation.

### ***Site***

18. A 'site' is defined as 'the whole area under the control of the same person [etc]'. See paragraphs [x] to [x] for more detailed guidance on the application of the regulations to sites that are shared between a parent company and its subsidiaries (or between subsidiaries).

### ***Singular and plural***

19. Throughout the Regulations the singular includes the plural: a licence, for example, may be granted in respect of a place or a number of places.

## **Regulation 3 Application**

3.(1) Except as provided for in paragraph (8), these Regulations shall apply —

- (a) in Great Britain; and
- (b) outside Great Britain as sections 1 to 59 and 80 to 82 of the 1974 Act apply by virtue of the Health and Safety at Work etc. Act 1974 (Application outside Great Britain) Order 2001<sup>(a)</sup>.

(2) Regulations 4 to 25 shall not apply to —

- (a) any activity to which Part IX of the Dangerous Substances in Harbour Areas Regulations 1987 (explosives) applies;
- (b) any activity to which the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2004 apply, apart from any activity which is to be treated as storage by virtue of regulation 2(6);
- (c) the master or crew of a ship or to the employer of such persons in respect of the normal shipboard activities of a ship's crew which are carried out solely by the crew under the direction of the master and in this sub-paragraph the reference to the normal shipboard activities of a ship's crew shall include —

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<sup>(a)</sup> S.I. 2001/2127.

- (i) the construction, reconstruction or conversion of a ship outside, but not inside, Great Britain; and
  - (ii) the repair of a ship save repair when carried out in dry dock;
  - (d) the transport of explosives by air;
  - (e) an offshore installation within the meaning of regulation 3 of the Offshore Installations and Pipeline Works (Management and Administration) Regulations 1995<sup>(a)</sup>;
  - (f) a mine which is, for the time being, solely used for, or in connection with, the getting of minerals or ensuring the safety of another mine.
- (3) Regulations 8 and 10 shall not apply to —
- (a) a constable in the execution of his duties;
  - (b) an inspector appointed under section 19 of the 1974 Act in the performance of his functions;
  - (c) a customs officer in the performance of his functions.
- (4) Regulation 10 shall not apply to —
- (a) the Executive;
  - (b) a local authority;
  - (c) the Commissioners of Customs and Excise;
  - (d) a police force; and
  - (e) a person employed as mentioned in section 15 of the Police Act 1996<sup>(b)</sup>(civilian employees) or section 9 of the Police (Scotland) Act 1967<sup>(c)</sup>(employees other than constables) who, in either case, is duly authorised in writing by the chief officer of police to store explosives.
- (5) Regulations 5 and 9 to 21 shall not apply to the manufacture or storage of explosives, at any site under the control of the Secretary of State for Defence, or held for the purposes of a visiting force or headquarters, under a scheme approved by him which —
- (a) provides for their safe manufacture and storage; and
  - (b) prescribes —
    - (i) separation distances, or
    - (ii) a combination of separation distances and other safety measures,

which are designed to ensure a standard of safety which is equivalent to that ensured by the separation distances prescribed by regulation 5 and Schedule 2.

- (6) Regulations 5 to 21 and 24 shall not apply to explosives —
- (a) seized by a constable in the execution of his duties,
  - (b) received by a police force from a member of the public; or
  - (c) which, for reasons of public safety or protection of property, are undergoing ordnance disposal by —
    - (i) persons under the direction of a member of Her Majesty's Forces or civilian employees of the Ministry of Defence authorised in writing by the Secretary of State for Defence to carry out ordnance disposal; or
    - (ii) persons under the direction of a constable or authorised in writing by the chief officer of police to carry out ordnance disposal.

(7) In relation to the application of these Regulations to ammonium nitrate blasting intermediates by virtue of regulation 2(2), regulations 10(1) and 11 shall not apply to the storage of ammonium nitrate blasting intermediates.

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<sup>(a)</sup> S.I. 1995/738.  
<sup>(b)</sup> 1996 c. 16.  
<sup>(c)</sup> 1967 c. 77.

(8) To the extent that these Regulations concern the importation of pyrotechnics into the United Kingdom, they shall extend to Northern Ireland<sup>(a)</sup>.

## **Guidance**

### **Scope of the regulations**

#### ***Explosives for personal and recreational use***

20. These Regulations apply to the manufacture and storage of explosives whether this is for work or non-work purposes. They would therefore apply to anyone storing explosives for personal recreational use, or to voluntary clubs or societies storing explosives (examples include storage for firework displays or re-enactment events).

#### ***Transport***

21. These Regulations do not apply to explosives that are being transported whether by road, rail, air or water provided that the explosives are not kept in one place for longer than 24 hours. However, these Regulations do apply to the transport of explosives on-site. This includes movements on public roads between different buildings on the same site.

22. The transport regulations on vehicle placarding and transport documentation do not apply to the movement of explosives where the vehicle is exempt from excise duty (eg some fork-lift trucks which may travel for short distances on public roads in moving between different parts of the site) or if the vehicle is being used for deliveries between private premises in the immediate vicinity (for example movements of explosives between manufacturing and storage buildings or between storage buildings).

#### ***Application offshore***

23. The Health and Safety at Work etc Act 1974 (Application outside Great Britain) Order 2001 extends these Regulations to UK territorial waters adjacent to Great Britain and to areas designated by order under section 1(7) of the Continental Shelf Act 1964. The Regulations do not apply to ships at sea or ships moored within harbour areas or to offshore installations as defined by regulation 3 of the Offshore Installations and Pipeline Works (Management and Administration) Regulations 1995 (see MSER regulation 3(2)).

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<sup>(a)</sup> By virtue of section 84(1) of the Health and Safety at Work etc. Act 1974, Parts I and IV of the Act extend to Northern Ireland "so far as may be necessary to enable regulations under section 15 to be made and operate for the purpose mentioned in paragraph 2 of Schedule 3", which includes, as a subject matter for such regulations, prohibiting the import into the United Kingdom of articles or substances of any specified description.

### ***Northern Ireland***

24. In contrast to the Explosives Act 1875, these Regulations do not apply in Northern Ireland.

### ***Ministry of Defence sites***

25. Regulation 3(5) disappplies the separation distance requirements under regulation 5 and the licensing requirements of regulations 9 to 21 from sites under the permanent or temporary control of the Ministry of Defence (MoD) operating under a licensing scheme established by the Secretary of State for Defence. This applies irrespective of the ownership of the site itself, or the status of the personnel. It should be noted that the MOD and HM forces are subject to the other duties on safe storage and manufacture.

26. MoD sites are subject to inspection by HSE and if it should be necessary, compliance with duties may be secured by enforcement action by HSE. The licensing scheme established by the Secretary of State is a mechanism for the MoD to ensure that it is compliant with the relevant requirements of the Regulations. The operation of the licensing system by MoD will be subject to scrutiny by HSE.

27. MoD will use different tables for determining separation distance requirements around its explosive buildings. These tables reflect the wider range of explosives and explosive articles used by the armed forces, together with a greater variety of storage facilities. These tables are designed to ensure an equivalent level of off-site safety to the tables in Schedule 2 to these Regulations and will be subject to scrutiny by HSE.

28. MoD's own regulations set out the measures that MoD personnel are required to take to ensure that MoD fulfils its duties under these Regulations. However, the specific legal status of this ACoP applies and if necessary MoD would need to demonstrate that the measures set out in its Regulations ensured a level of safety that was at least as good as that required by the ACoP.

### ***Explosives in use***

29. These regulations do not apply to explosives that are in use. Storage includes all possession, keeping or holding other than when the explosives are actually undergoing manufacture or are in use. Normally all unused explosives must be returned to a suitable store at the end of each day. However, there may be circumstances such as a complex demolition or blasting operation, or fireworks display when explosives charges are left



overnight in the shothole or attached to the structure to be demolished. The operator or blasting contractor would have to make appropriate arrangements for supervision of the explosives to ensure their safety. They would also have to comply with their duties (under the Control of Explosives Regulations) to take appropriate measures to ensure that such charges are properly safeguarded to prevent unauthorised access.

30. While the operations are continuing, these explosives would be regarded as being in use. However, were the operations to cease, or be suspended for any length of time, the explosives could be regarded as no longer in use and therefore subject to these Regulations. In the event of a prosecution, the Court would then need to decide, as a matter of fact, whether in the specific circumstances the explosives were, or were not, in use.

## **SAFETY REQUIREMENTS**

### **Risk assessment, management, training and information**

Overview box: The Management of Health and Safety at Work Regulations 1999 (MHSWR) require the risks from a work activity to be assessed and appropriate measures taken to control them. Further requirements to carry out an assessment in relation to risks arising from dangerous substances are contained in The Dangerous Substances and Explosives Atmospheres Regulations 2002 (DSEAR). The following sections provide Approved Code of Practice and guidance to MHSWR and DSEAR to help those with responsibilities to undertake a risk assessment. This includes material aimed at those engaged in specific activities such as selling fireworks and other pyrotechnic articles, storing explosives, firework display operators, and explosives manufacturers. Further sections cover management arrangements, employee consultation, employee responsibilities, training and competence, information on safety precautions and actions, and workplace rules.

31. It should be noted that the material in paragraphs [x to y] is Approved Code of Practice to the Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR). Regulation 5 of those Regulations requires a risk assessment to be carried out to identify whether dangerous substances are present and the risks they present. DSEAR applies to all hazards arising from both the manufacture and storage of explosives and from the other dangerous substances present on site (including,

for example, substances not being used, or those in storage waiting to be used).

## **[Risk assessment**

### ***Introduction***

signposting box: The following section explains the general principles involved in undertaking a risk assessment. It then goes on to cover issues that will need to be considered by those involved in:

- selling fireworks and other pyrotechnic articles in shops;
- storing fireworks and other pyrotechnic articles other than in shops;
- storing explosives other than fireworks and other pyrotechnic articles;
- operating firework displays; and
- manufacturing.

### ***General principles***

32. Regulation 3 of the Management of Health and Safety at Work Regulations 1999 (MHSWR) requires all employers and self-employed people to assess the risks to workers and any other people who may be affected by their work or business, to enable them to identify the measures they need to take to comply with health and safety law.

33. Regulation 5 of the Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) requires a risk assessment to be carried out to identify whether dangerous substances are present and the risks they present. DSEAR applies to all hazards arising from both the manufacture and storage of explosives and from the other dangerous substances present on site (including, for example, substances not being used, or those in storage waiting to be used).

34. The risk assessment must be undertaken before any new work activity involving dangerous substances begins.

35. The risk assessment has five steps:

- identify the hazards;
- decide who might be harmed, and how;
- decide what safety measures are needed;

- record the significant findings of the assessment; and
- review the assessment.

36. It is important to consult and involve safety representatives and employees in the process of drawing up the risk assessment (see also paragraphs 63 to 65).

***Identifying the hazards***

37. The major hazards to be considered are fire and explosion. However in certain circumstances there will be secondary hazards such as the release of toxic substances to be considered. Risks to health will also need to be addressed in meeting the requirements of other regulations (for example the Control of Substances Hazardous to Health Regulations 2002 and the Manual Handling Operations Regulations 1992).

*Who might be harmed?*

38. This will include members of staff but depending on the circumstances the risk assessment will need to consider hazards to:

- the public - either on-site or off-site;
- workers at other neighbouring premises;
- visitors and contractors working on-site.

***What needs to be done?***

39. Determining what safety measures are necessary will involve considering:

- sources of ignition - how could a fire start? what could start an explosion
- how might it spread or get worse?
- how would it affect people? This needs to consider not only the immediate effects but also the impact on people's ability to escape.

***Recording the results of the risk assessment***

40. Where there are five or more employees, the employer must record the significant findings of the risk assessment and the measures that have been or will be taken to control the risks identified in the assessment.

41. In this context "employee" means someone who works under a contract of employment. The contract may be express or implied, and if express may be oral or in writing. Although the issue has not been tested before the courts it is recommended that newsagents consider paperboys and girls as employees.

42. Although employers with less than five employees are exempt from the recording requirements, it is recommended that they record the significant findings in order to help them in considering the safety measures they need to take.

43. It must be stressed that the record need not be complicated or extensive. The purpose of the record is to act as a checklist to ensure that necessary safety measures are taken.

A sample model risk assessment checklist and record form is included at page?

#### *Provision of information about the risk assessment*

44. The main findings of the risk assessment should be made available to workers and/or their representatives. The way in which this information is provided will depend on the nature and degree of risk found by the assessment. This may vary from oral communication to individual instruction and training, supported by information in writing.

#### **Signposting box: Implementing the conclusions of the risk assessment**

45. The ACOP and guidance to regulation 4 provides information on the measures that will need to be considered and put into operation. These should be seen as three consecutive steps, ie:

- reducing the hazard;
- controlling the risks;
- where the risk of an accident cannot be eliminated, putting protective and mitigating measures in place.

#### *Review and revision*

46. Regulation 3(3) of the Management of Health and Safety at Work Regulations 1999 (MHSWR) requires that the assessment must be reviewed from time to time to make sure that the precautions are still effective. Those Regulations also require a review of the assessment where there is any significant change - for example new machines, substances or procedures - which could create new risks. The risk assessment must be rechecked when processes or products are restarted after a long gap: circumstances may have changed, and present staff may not be familiar with the product or process.

**Signposting box: the following sections give further guidance on risk assessment aimed at specific activities. There are three subsections:**

- storage of fireworks and other pyrotechnic articles;
- storage of high explosives;
- firework fusing
- manufacture.

*Storage of fireworks or other pyrotechnic articles*

47. When storing fireworks or other pyrotechnic articles, the primary hazard that needs to be considered is fire or accidental ignition. Shops such as DIY superstores would also need to consider the additional hazard presented by flammable materials (for example, white spirit) present on the premises and the potential for a firework fire to spread to flammable materials.

Signposting Further guidance on safety measures with particular relevance to shops is given in paragraphs [x to y]

*[box here - who needs to read this? What is in this section eg this section is primarily intended for those who are storing high explosives however it will also be relevant to those holding the more energetic types of firework]*

*Storing high explosives*

48. Someone storing high explosives (explosives with a mass explosion hazard eg blasting explosives, black powder, and the more energetic types of firework) needs to consider a broader range of issues. Depending on the type of explosive, potentially any application of energy might initiate an explosion. Sources of initiation to consider include:naked lights/flames;

- electricity (including static electricity and electromagnetic energy);
- heat temperature and pressure;
- sparks from mechanical or frictional contact between metal surfaces;
- impact and friction; and
- chemical incompatibility between certain substances.

49. Other issues which need to be considered - again depending on the characteristics of the explosive concerned - include risks from:

- contamination of the explosive with grit etc;
- contact with water;

- contact with chemically incompatible substances (including, for example, bare rusted metal);
- reduction of chemical and thermal stability over the life of the explosive.

Signposting box: Further guidance on sources of initiation is given in paragraphs 92 to 155 and on safety measures is given in paragraphs 320 to 325 [recheck references]

### *Firework fusing*

50. Firework display operators need to consider the possibility that an explosion might be initiated accidentally during work on fusing or putting together a display. Need to expand to highlight particular issues eg nipping fuses during manipulation

Signposting box: Further guidance on safety measures for fusing operations is given in paragraphs 374 to 377.

51. ~~Manufacturers~~Manufacturers of explosives face the greatest range of issues to consider because of the range of tasks and situations they might encounter. In carrying out the risk assessment for manufacturing activities, the employer needs to consider risks arising from activities such as:

- the manufacturing activity itself;
- transport and movement of explosives and other hazardous substances around the site;
- disposal and decommissioning of explosives and explosive-contaminated equipment;
- ancillary activities such as cleaning, testing and quality control;
- storage, including movements in and out of storage; and
- maintenance.

52. Where contractors are employed, the risk assessment will also need to consider whether there are additional risks from the activities they are engaged in. The risk assessment will also need to consider whether there are other factors (for example, unfamiliarity with the site) to take into account. The following points need to be considered in assessing the potential for a fire or explosion:

- any intrinsic properties of the explosive that can affect the risk of an explosion, for example critical diameter or critical bed depth;

- the sensitivity of the explosives under ambient and process conditions to various stimuli; i.e. heat, flame, impact, friction, shock or electricity. For operations involving the processing of explosive substances and compositions, knowledge of their sensitivity to these stimuli is essential in order to identify the control measures which are necessary, for example the level of protection against static electricity required; and
- any factors that might affect the sensitivity of the explosive - under both normal and abnormal operating conditions - for example through contamination, degradation or chemical reaction or the loss of a desensitising agent.

53. It should be emphasised that the risk assessment should not simply address the risk factors that might arise in normal operation. It also needs to consider conditions under which the hazard might change and address risk factors which might arise during reasonably foreseeable circumstances. These include:

- spread of fires from neighbouring properties and buildings
- operator error or other inadvertent deviations from laid-down operating procedures;
- equipment malfunction, including failure of a cooling system leading to loss of control of an exothermic reaction;
- contamination of supplied ingredients - or ingredients not being as specified - including the introduction of foreign material;
- loss of containment;
- effects of interruptions/breaks (whether planned or unplanned);
- service failures (such as loss of power supplies or water); and
- maintenance.

54. It should also be borne in mind that the behaviour of an explosive or substance in bulk, or in production conditions may differ from the intended effect or the behaviour in laboratory conditions. For example, explosives which might normally simply deflagrate could, under confinement, produce a mass explosion.

55. In addition to considering the issues associated with fire and explosion hazards, the employer needs to consider any hazards arising from other substances or combinations of substances which are either used in the manufacturing process or which may be present at the site. These include:

- harmful effects to persons which might arise from the release of the substance;
- the potential that the release of the substance might lead to an explosion (for example the release of diesel which if ignited might in turn cause a bulk store of ammonium nitrate to explode);
- the potential for the consequences of an explosion to be severely aggravated by the release of other hazardous substances.

56. For more complex operations involving chemical processing, or for operations controlled by programmable logic control, appropriate tools such as Hazard and Operability Studies (HASOPS) and Failure Mode and Effects Analysis (FMEA) are recommended to assist in identifying potential areas where loss of control could result in an accidental fire or explosion. Consequence analysis and event tree analysis techniques may be useful in some situations.

### **Higher-risk operations [consider terminology]**

57. The risk assessment will also need to identify whether there are any operations that present higher risks, for example:

- maintenance work involving 'hot work' in explosives buildings or on explosives equipment (see paragraphs...);
- pumping operations (see paragraphs...);
- work involving handling particularly sensitive explosive compositions (see paragraphs...).

**Signpost forward to safety measures [more difficult as split over various sections].**

### **Management arrangements**

#### **Guidance**

##### *Introduction*

[Signposting box: The following section covers management arrangements for health and safety. It then provides information about the following issues that will need to be covered in the arrangements:



- employee consultation on health and safety;
- employee responsibilities;
- training and competence;
- provision of information on safety precautions and actions; and
- workplace rules on safety policy and procedures.

This section is relevant to anyone manufacturing or storing explosives. However it must be emphasised that the complexity of the management arrangements will depend on the complexity of the operation. A small firm that is simply storing explosives will need much simpler management arrangements than a large manufacturer.

58. Regulation 5 of the Managing Health and Safety at Work Regulations requires employers to have arrangements in place to manage health and safety. Effective management of health and safety will depend, among other things, on a risk assessment being carried out and the findings being used effectively.

59. It is important that management arrangements are drawn up to ensure that appropriate arrangements for health and safety in the workplace are in place and that roles and responsibilities are specified and understood.

60. The arrangements need to be integrated into the management system for all other aspects of activities carried out at the site.

Information box: General guidance on health and safety management is given in HSE guidance *Successful health and safety management* ISBN 0717612767 [could we put this in a small box in the side column?].

61. The management arrangements should clearly specify the arrangements and responsibilities (where relevant) for:

- carrying out, and periodically reviewing the risk assessment;
- assessing (and reviewing) the training needs for staff and contractors and making arrangements for any necessary training;
- the design, layout and construction of the establishment and initiating any changes to it;
- the selection and specification of work equipment (including personal protective equipment), plant and materials;

- planning, prioritisation, and carrying out of maintenance work, together with inspection and testing of alarm and firefighting systems and the keeping of appropriate records;
- the operation of formal systems of work - including permits to work on certain activities - and arrangements for the control of access to danger areas;
- providing information to employees and contractors;
- ensuring co-ordination and co-operation with contractors;
- control and supervision of contractors' staff;
- ensuring coordination and cooperation with all users of the site - whether tenants or different operating arms of the same company;
- emergency planning;
- the reporting and investigation of accidents and 'near misses' and any necessary follow-up action; and
- ensuring compliance (where appropriate) with licence or registration conditions.

62. A manager or member of staff may undertake more than one of these roles - equally on larger sites there may be more than one member of staff with responsibility for a particular area of work.

#### ***Employee consultation***

63. It is essential that the workforce is actively involved, either directly, or through their representatives, in the development and maintenance of workplace health and safety.

64. Proper consultation with the workforce is crucial in helping to raise awareness of the importance of health and safety and can make a significant contribution to creating and maintaining a safe and healthy working environment and an effective health and safety culture. In turn, this can benefit the business by reducing accidents and incidents of work-related ill health.

65. Employers are required by law to consult their employees on health and safety matters. The Safety Representatives and Safety Committees Regulations 1977 (SI 1977/500 ISBN 011705009) provide for safety representatives to be appointed by trade unions that are recognised in the workplace. Safety representatives appointed under those Regulations by recognised trade unions must be consulted by employers. Employees who are

not covered by such representatives must, under the Health and Safety (Consultation with Employees) Regulations 1996 (SI 1996/1513 ISBN 0110548396), be consulted either directly or indirectly, through elected representatives.

### ***Employee responsibilities***

66. Although MSER places no specific duties on employees, Section 7 of the Health and Safety at Work etc Act 1974 (HSWA) requires all employees to take reasonable care of their own health and safety and of the health and safety of others who may be affected by what they do at work. Section 7 also places a duty on employees to co-operate with their employer to comply with statutory duties for health and safety.

67. Regulation 14 of MHSWR is also relevant as this places specific duties on employees to:

- use all machinery, equipment, dangerous substances or other equipment provided by their employer correctly, in accordance with any training and safety instructions they have received;
- inform their employer (or anyone appointed by them to assist with health and safety) without delay of any work situation which might present a serious and imminent danger. Employees should also notify any shortcomings in the health and safety arrangements, even when no immediate danger exists, so that, if needed, remedial action may be taken.

It should be noted that the duties placed on employees under MHSWR do not reduce the responsibility of the employer to comply with duties under those regulations and other relevant statutory provisions.

### **Training and competence**

Overview box: In the following section paragraphs 68 to 75 are Approved Code of Practice to regulation 13 of MHSWR, which require employers to ensure that employees are provided with adequate health and safety training.

#### **ACOP**

68. It is essential that all staff have the necessary training and competence for the work they undertake. This covers not only the skills necessary to undertake their work under normal conditions, but also an appropriate understanding of the hazards and risks which may arise and the action to be taken in abnormal or emergency situations.

69. The training employees require, and the training arrangements, will depend on the nature of the activity and the type of explosive. For example employees in shops or other premises involved in the storage of fireworks will need to know and understand:

- the safety measures to be taken to prevent fire;
- the importance of keeping flammable or combustible materials away from the fireworks;
- the action to be taken in the event of a fire.

70. Employees involved in the storage of other explosives will similarly need to know and understand the safety measures to be taken to prevent initiation eg excluding sources of radio frequency or electrostatic energy. They will also need to understand the importance of good housekeeping to exclude possible contaminants.

71. It will also be necessary to consider the training and competence requirements of contractors. For example contractors involved in installing electrical fittings and other equipment will need to be aware of the particular requirements for explosives buildings - or be under the supervision of someone who is familiar with these requirements. Contractors will also need to know what action to take in the event of an emergency.

72. The training and competence requirements for workers in explosives manufacture are potentially the most extensive. All workers (employees and contractors) need to:

- understand the nature of the risks and hazards that may arise out of the processes in which they are involved. For example, if the particular explosive concerned is sensitive to friction and impact then employees involved must understand the precautions to be taken in its handling;
- be competent in the use of the work equipment they need, and where necessary in the selection of appropriate equipment for particular tasks;
- understand when personal protective equipment is required and be competent in its use;
- know what abnormal and hazardous conditions may arise, what warning signs to look for and what action to take in the event of a warning sign being detected;
- know what hygiene and housekeeping procedures need to be followed;
- know what workplace rules apply;

- know what action to take in the event of an emergency.

73. In certain areas, workers are likely to require more extensive competence and/or training, for example workers with responsibility for:

- management and supervision;
- the design and specification of products and processes;
- the selection and/or specification of work equipment and the preparation and specification of maintenance schedules;
- risk assessment and the design and specification of safety measures including the selection of personal protective equipment;
- quality control of materials;
- maintenance and installation of work equipment and plant.

74. In certain circumstances, such as where there is a need for particular specialist expertise, or where there is a discrete task to perform, it may be necessary to use external contractors. When employing contractors, the employer must confirm that the staff concerned have received the necessary training and have the necessary competence.

75. There must be appropriate mechanisms for assessing and identifying training and competency needs and for taking follow-up action where training needs are identified. The extent and formality of these systems depends on factors such as the size of the organisation, rate of turnover etc. A mechanism for review at periodic intervals will be needed and when there have been significant changes such as:

- changes in the process, including the manufacture of new articles;
- the introduction of new work equipment;
- the use of new substances; and
- changes in staff.

#### Information on safety precautions and actions

76. Staff, contractors and anyone else working on (or visiting) the site must be provided with appropriate information on safety, including, where relevant, information on:

- workplace rules including for example, rules on the carrying/use of mobile phones and other radiocommunications devices;
- limits on the quantity of explosives and numbers of people permitted in explosives buildings;
- types of tools and equipment permitted for use in explosive buildings and explosives areas;
- incompatible materials, substances etc that must be kept away from explosives or explosive substances;
- the location of controlled areas;
- the use of personal protective equipment;
- procedures to be followed in the event of an emergency; and
- other health and safety systems as relevant (in particular the use of permit-to-work or other systems where maintenance work is to be carried out).

77. It should be borne in mind that signs or notices are not necessarily the only way to communicate safety information and should not be seen as a substitute for the provision of appropriate training, instruction and supervision.

### Workplace rules

78. At manufacturing and larger storage sites, the most important safety policies and procedures should be set out in workplace rules and every employee will need to receive a copy. The content of the rules will depend on the risk assessment at the workplace, local conditions etc. Examples of some of the areas that they should cover are given in the following paragraphs.

79. Smoking and smoking materials must be prohibited in explosives areas. The possession of matches, and other sources of ignition must also be prohibited unless expressly authorised (for example under a permit-to-work system). The rules must be clear about where such prohibitions apply. The rules must be clear about where, if at all, smoking is permitted in non- explosives areas.

80. The workplace rules must prohibit:

- the introduction of alcohol or any illegal drug into any explosives building or explosives area;
- working while under the influence of alcohol or any drug which might impair concentration;

- admitting any person who appears to be intoxicated into any explosives building or explosives area.

81. As a guide in setting limits for their workplace, employers may wish to note that, under section 92 of the Railways and Transport Safety Act 2003, a person is considered unfit for duty if the following limits are exceeded:

- 9mg of alcohol in 100ml of breath;
- 20mg of alcohol in 100ml of blood; and
- 27mg of alcohol in 100ml of urine.

82. Where appropriate, the workplace rules will also need to require workers and contractors to co-operate with any reasonable request to search for articles which might provide a source of ignition (for example, matches, lighters, mobile phones, pagers; or articles which might provide a source of contamination).

83. Employees should be required to report if they are prescribed any medicine that might affect their ability to drive or operate machinery etc.

84. Where the risk assessment finds it necessary, the workplace rules must clearly specify the areas of the establishment where the use and carrying of mobile phones, pagers and other radiocommunications devices are prohibited. Similarly, where the risk assessment finds it necessary, the rules must specify where the use of such equipment is prohibited except where expressly authorised.

85. The workplace rules must set out any restrictions on any other articles or substances which may not be taken into explosives areas (for example jewellery, food and drink).

86. Where appropriate, the rules will also need to cover the importance of not putting on or removing items of clothing in the presence of explosives substances or articles.

87. If there are areas on the site where entry is controlled, the rules will need to state where these are.

88. The rules may also need to cover where eating and drinking are permitted and any hygiene precautions to be taken by workers who may come into contact with toxic substances.

## **SAFETY REQUIREMENTS**

### **Regulation 4 Fire and explosion measures**

- 4.—(1) Any person who manufactures or stores explosives shall take appropriate measures —
- (a) to prevent fire or explosion;
  - (b) to limit the extent of fire or explosion including measures to prevent the spreading of fires and the communication of explosions from one location to another; and
  - (c) to protect persons from the effects of fire or explosion.

(2) For the purposes of paragraph (1), the reference to the manufacture or storage of explosives shall be deemed to include a reference to any handling, on-site transport and testing of explosives which is associated with that manufacture or storage.

(3) In this regulation, “fire or explosion” means unplanned fire or explosion at the site of manufacture or storage.

### **Introduction**

Signposting Box: This section has four parts. The first three parts follow the structure of regulation 4(1):

- Part 1 gives guidance on preventing a fire or explosion. This includes guidance design and construction, selection of work equipment, and safe working practices.
- Part 2 discusses measures to limit the extent of a fire or explosion
- Part 3 gives guidance on protecting people in the event of a fire or explosion, including emergency arrangements.

These parts cover general principles that are relevant to anyone involved in the manufacture and storage of explosives.

Part 4 gives specific guidance for those involved in:

- storage and display of fireworks and other pyrotechnic articles in retail premises (paragraphs 0 to 0);
- storage of other explosives (paragraphs 320 to 322);
- fusing of fireworks (paragraphs 374 to 377);
- storage of ammonium nitrate, ANFO and ammonium nitrate emulsions (paragraphs 327 to [x]);
- mixing of emulsion explosives and ANFO (paragraphs 362 to [x]).

Overview Box: Regulation 4 requires anyone manufacturing or storing explosives to prevent fire and explosion. The safety measures will



depend on the nature of the operations and the explosive but will involve controlling sources of energy that could initiate an explosion ('sources of initiation'). It also requires measures to limit the extent of a fire or explosion. This involves limiting the numbers of people who might be affected if there were a fire or explosion and limiting the amount of explosives involved. Finally the regulation requires measures to protect people in the event of an explosion: for example ensuring people can quickly escape in the event of a fire or making provision to protect them from the effects of a blast.

It should be emphasised that the measures required are not necessarily complex. To take the example of a store holding a smaller quantity of Hazard Type 4 pyrotechnic articles, the main measure to prevent an explosion would be to exclude naked flames and heaters. The main measures to limit the extent of the fire or explosion would be to keep the articles away from stocks of flammable substances.

## ACOP

### PART 1: PREVENTING FIRES AND EXPLOSIONS (REGULATION 4(1)(A))

**Signposting Box: The following paragraphs are relevant to anyone with duties under these regulations.**

89. The principal issue to be addressed is that of preventing the accidental initiation of explosives. This involves keeping sources of ignition (such as open flames) away from the explosives. It also involves controlling the presence of explosives (including explosive vapours and dusts) especially in areas of activity, for example, places where work is done or where people or other traffic move around regularly.

90. The sources of ignition which need to be considered will depend on the conclusion of the risk assessment. In all cases employers will need to take precautions to exclude naked lights/flames. In other cases, depending on the results of the risk assessment it will be necessary to consider:

- electricity (including static electricity and electromagnetic energy) (see paragraphs 92 to 120);
- heat and temperature (see paragraphs 127 to 136);
- pressure (see paragraphs 137 to 141);

- sparks from mechanical or frictional contact between metal surfaces (see paragraphs 121 to 126);
- impact and friction (see paragraphs 0 to 146); and
- chemical incompatibility between certain substances (see paragraphs 147 to 155).

Signposting Box: the following section is primarily relevant to manufacturers, anyone storing high explosives, and firework display operators. It opens with an overview of the safety measures to be taken while storing these items and then goes onto give specific guidance on particular sources of initiation (eg electrical energy) and the measures to be taken to prevent an explosion.

### Common precautions

91. The precautions that need to be taken will depend on the results of the risk assessment but will include some or all of the following:

- excluding naked flames etc;
- excluding sources of electrical energy which could produce sparks or otherwise initiate the explosives;
- preventing accidental initiation from frictional or impact energy;
- preventing accidental contact between exposed metal surfaces;
- preventing accidental contact between explosives and exposed hot surfaces;
- preventing contact between explosives and chemically incompatible surfaces
- preventing contamination of explosives and ingredients (including contamination by water);
- minimising the time that explosives are in an unstable intermediate state before final processing;
- avoiding the uncontrolled build-up of waste explosives and, where it creates a hazard, ensuring complete removal before maintenance operations; and
- preventing the build-up of flammable gases, vapours and explosive dusts through the provision of adequate ventilation including, where necessary, extraction systems.

### Electrical, electrostatic and electromagnetic energy

Signposting box: Paragraphs 92 to 120 cover the particular hazards posed by electrical, electrostatic and electromagnetic energy (including lightning). They are relevant to anyone manufacturing or storing explosives but are particularly relevant where explosives substances or articles that are sensitive to electrical initiation, such as electric detonators or fuzeheads, are manufactured or stored.

## ACoP

### *General*

92. The presence of electrical energy (including electrostatic or electromagnetic energy) brings with it a risk of a spark initiating an explosion or of setting off an igniter or fuse head. The presence of electrical energy in and around explosive buildings must be kept to the minimum necessary.

93. Overhead power lines and telephone wires must not cross over, or terminate on, an explosives building nor should underground cables pass under it. Overhead lines leading to the building must terminate away from it with the final connection made underground, fitted with appropriate surge protection. Where new cables are laid they will need to incorporate appropriate protection against mechanical damage.

94. Conductors, generating plant, or high-voltage transformers and switchgear must be located at a suitable distance away from explosives buildings. It is inadvisable to site switchgear and distribution boards inside a room containing explosives.

95. Electrical equipment should generally be sited outside areas where explosive substances are present; only equipment essential for production purposes should be sited in buildings where flammable gases and vapours or explosive dusts may be present. In this case the equipment must be designed and constructed to prevent it becoming a source of ignition. Further information is contained in *Electrical installations in hazardous areas* BS PD 60079-14 British Standards Institute.

96. Socket outlets must not be fitted in buildings where flammable gases or vapours may be present. Sockets may be used, when absolutely necessary, in places where explosive dust alone could be present. In this case, they will need to meet the requirements of *Electrical apparatus for use in the presence of combustible dust* BS EN 50281 and the appropriate IP rating (BS EN 60529 *Specification for degrees of protection provided by*

*enclosures* gives a description of IP rating). The advice of a competent specialist should be sought before fitting any socket outlets.

#### *Portable electrical equipment*

97. A risk assessment must be carried out before any portable electrical equipment is used in a process building. The risk assessment must consider the presence of explosive atmospheres and the potential for electrical spark from the motor or during use. It must also consider other risks during use (for example, frictional heating) and the maintenance of suitable separation from explosives.

98. Unless relevant technical advice has been obtained, mains-operated portable equipment must not be used where:

- explosive gases or vapours may be present; or
- explosives are exposed which may give rise to explosive dust.

99. Battery-operated equipment should only be used in places where explosives do not give rise to flammable vapour or explosive dust. Further information is given in *Electrical apparatus for the use in the presence of combustible dust* BS EN 50281 British Standards Institute.

100. The use of either mains or battery-powered electrical equipment in an explosives building may be permitted once the building has been cleared of all explosives or, where the building is divided into rooms which can be isolated from one another, where the room has been cleared of all explosives and the room isolated from the rest of the building. In other cases, if it is not feasible to clear the whole building then a risk assessment will need to be carried out and suitable arrangements must be made to isolate the area where the work is being carried out. The equipment must be suitable for the environment including, where appropriate, the means to prevent dust entering the equipment. Electrical equipment should never be left unattended when connected to the supply.

101. Electrical test equipment for use with explosive articles must not be capable of arming or firing the devices. The necessary information, such as the limiting voltage and current, will need to be obtained from the equipment supplier or manufacturer to allow an analysis to be carried out which demonstrates the risk to be as low as reasonably practicable. In the small number of cases where adequate assurance may not be available, assessment testing under strictly controlled conditions may be appropriate. Where analysis does not provide the

necessary assurance of safety, personnel must be excluded from processes and provided with suitable protection.

#### *Lightning protection*

**Signposting box: this section is relevant to anyone storing explosives other than small arms ammunition or HT4 fireworks**

102. Suitable lightning protection must be installed in explosives stores except where the store is:

- temporary (for example, for no more than a few weeks on a seasonal basis), holding Hazard Type 4 pyrotechnic articles or Hazard Type 4 small arms ammunition;
- licensed to keep less than 75 kg of explosives;
- contains only Hazard Type 4 small arms ammunition; or
- made by excavation;
- exempted under the terms of a licence issued by HSE.

**Information box: Hazard Type 4 pyrotechnic articles include items such as consumer fireworks, flares, smoke signals, cable cutters, explosive rivets, toy caps, party poppers and cracker snaps in bulk for Christmas crackers. While strictly not pyrotechnic articles, some other Hazard Type 4 explosives, such as small arms ammunition and nailgun cartridges, may be treated in a similar way when kept in shops and other premises.**

103. For process buildings, the need for lightning protection must be considered as part of the risk assessment. The assessment might consider how much warning can be given of an impending thunderstorm and whether the explosives could be transferred to a suitable store with lightning protection before the storm arrives. If it is not feasible to remove the explosives from the process building, the assessment will need to consider the probability of initiation of the explosives and the consequences in deciding whether lightning protection is required.

104. Bearing in mind the exceptions in paragraph Error! Reference source not found., steel ISO or similar containers used for the storage of explosives can be regarded as self-protecting provided that:

- the walls are lined with wood or the explosives are not kept in direct contact with the walls;
- the panels and doors are electrically bonded with straps of at least 50 sq mm;

- two earthing points connected to earth rods are provided at opposite corners; and
- resistance from the top of the container to earth is less than 10 ohms (where ground conditions will not allow this, see BS 6651 *Protection of structures against lightning* for further information).

105. Lightning protection will need to be based on the requirements set out in British Standard BS 6651: 1999 *Code of practice for protection of structures against lightning*. The method of protection will depend on the nature of the area to be protected and include the use of a suspended air termination network at an adequate height above the area to be protected and/or any vertical conductors. All metallic reinforcement, crane and railway rails which enter explosives buildings must be bonded to the nearest point of the lightning protection system. All lightning protection systems must be inspected and tested by a competent person. Inspections and tests should be conducted at least every eleven months at intervals that ensure the system is tested during every season of the year.

106. All main structural metalwork in and on the explosive building (including the lightning and anti-static protection systems) needs to be connected to a common system of earthing and equipotential bonding. It is essential that metallic enclosures of electrical switchgear, motors, starters and other electrical appliances are suitably earthed. Metallic cable sheaths or armouring, metal projections through walls (pipes, rails etc) need to be suitably bonded to the lightning protection system. Provision will need to be made to allow access to the earth electrodes for testing purposes.

107. Steel-framed structures with metallic cladding may be regarded as self-protecting provided the individual earth resistance of each stanchion, in a stand-alone condition, does not exceed ten ohms. The metallic cladding must be bonded to the structure by suitable metal fixings and electrically bonded with straps of the same cross-sectional area as the main down conductor, and at least 50 sq mm. Where these conditions cannot be met, a ring conductor, bonded to each stanchion and with earth electrodes at each end of the structure, will need to be provided.

## **ACoP**

### *Electromagnetic energy*

**Signposting Box:** Electromagnetic energy emitted from radio transmitters and other devices such as mobile phones, beepers, pagers, transmitters and electrical cables can be collected by pipework or other metal structures acting as aerials. The energy can be released when the 'aerial system' is broken. Certain explosives are also sensitive to electrostatic discharges. The guidance in this section is particularly relevant where explosives sensitive to this type of energy, such as electro-explosive devices (EED's) are manufactured, stored or handled.

108. It is strongly recommended that, where reasonably practicable, suitable fixed communication systems should be provided in order to eliminate the use of portable communications devices. Where the use of such equipment is unavoidable, the risks posed by the transmission characteristics will need to be assessed. It is essential to maintain a margin of at least 12 decibels (dB) below the 'no fire hazard' threshold of the most sensitive device present. As part of the pre-planning for emergencies, the police, fire and emergency services will need to be informed if explosives sensitive to the radio energy are, or may be, present so that they may make a similar assessment of their radio communications equipment.

**Information box:** Further information on the assessment of risks from radio frequency radiation is contained in *Assessment of inadvertent ignition of flammable atmospheres by radio frequency radiation* BS 6656:2002 and *Assessment of inadvertent initiation of bridge wire electro-explosive devices by radio frequency radiation* BS 6657:2002 British Standards Institute. Information about the location, frequency range, transmitter power etc of cellular radio transmitters is available from the Radio Communications Agency [url?].

## **Electrostatic energy**

**Signposting box:** this section is particularly relevant to anyone storing or manufacturing [give examples ]

**Overview Box:** Electrostatic charges are commonly generated by contact electrification, when two dissimilar materials are brought together then separated. Other mechanisms which generate separated charge include charging by induction and charge transfer. Separated electrostatic charges quickly combine either directly or via the earth unless they are prevented from doing so. The main ways in which separated charges are retained are:

- on a conductor insulated from other conductors and from earth by a non-conductor; and
- on a non-conductor by virtue of the resistance of the material itself.

The spark discharge of accumulated electrostatic charges can initiate a fire or explosion. The electrostatic energy required to cause ignition varies with the type of explosive and its physical state. In general, primary explosives are much more sensitive than propellants or high explosives, while pyrotechnics exhibit a wide range of sensitivity. The guidance must be followed in all cases where the explosive is sensitive to electrostatic energy - the level of the precautions will depend on the explosive.

109. It is essential to limit the electrostatic charge on people handling electro-sensitive explosive substances and articles. Accumulation of charge is dependent on a number of variables but can be controlled by the use of conductive/antistatic shoes and floors and the correct humidity. An antistatic regime is required when materials with ignition energies of 1mJ and above are present. A conductive regime is required where materials with ignition energies of less than 1mJ are present.

110. The extent of the precautions that are required depends upon the sensitiveness of the explosives. There are three broad degrees of precaution, usually referred to as:

- first degree - avoidance of exposed, isolated conductors and earthing of all large conducting objects (such as fixed plant and equipment);
- intermediate - first degree plus anti-static measures to reduce accumulation and retention of electrostatic charge; and
- second degree - first degree plus conducting measures to prevent accumulation and retention of electrostatic charge.

111. *First-degree precautions* are appropriate for comparatively insensitive explosives (those with a minimum spark energy for ignition greater than 450 MilliJoule (mJ)).

112. *Intermediate precautions* are required for sensitive explosives (those with a minimum ignition energy greater than 1mJ but less than 450 mJ). In addition to first degree precautions, specific measures include:



- use of antistatic materials and effective earthing for all equipment, work benches, chairs, boxes or other containers and other movable or portable items;
- strict control of high-resistivity materials such as plastics, rubber and glass. Where it is necessary to use these materials they should not have a surface area greater than 75 cm<sup>2</sup>;
- provision of conductive floors in accordance with BS 2050, with a resistance from surface to earth of between 50 kilo ohm (kohms) and 2 Mega ohm (Mohms);
- provision of antistatic footwear in accordance with the relevant resistance requirements in BS 5145 and BS 7193;
- maintaining the relative humidity of the atmosphere at 65% or above. It may be acceptable to reduce this, if a risk assessment, carried out on a case-by-case basis, shows that electrostatic charges cannot be acquired but, in any event, a relative humidity of 40% is the absolute minimum that must be maintained;
- provision of suitable external work clothing which is not liable to generate electrostatic charge. It is preferable that the clothes are made of fire-resistant cotton, rather than man-made fibres. Clothing must not be put on or removed in the presence of any explosives substances or articles; and
- if the use of wrist or ankle straps are specified as part of the required antistatic precautions, then they should be of a quick release type and comply with BS EN 61340-5-1:2001 *Electrostatics. Protection of electronic devices from electrostatic phenomena. General requirements*; and the end-to-end resistance including the strap, cabling and termination contact should be between 900 kohms and 35 Mohms. Connections for straps should be dedicated for each working area and should be readily accessible.

Need an information box on the difference between 'anti-static' and 'conducting'.

113. *Second-degree precautions are required when dealing with very sensitive explosives (those with a minimum spark energy up to and including 1 mJ). In addition to first degree precautions, specific measures include:*

- use of conducting materials and effective earthing for all equipment, work benches, chairs, boxes or other containers and other movable or portable items;

- avoidance of high-resistivity materials such as plastics, rubber and glass;
- provision of conductive floors in accordance with BS 2050, with a resistance from surface to earth of less than 50 kohms;
- provision of conducting footwear in accordance with the relevant resistance requirements in BS 5145, BS EN 345 and BS 7193;
- installation of personal resistance monitors at every entrance. When handling compositions having ignition energies of less than 100 Micro Joules, the use of personal resistance monitors at individual workstations is recommended; and
- maintaining the relative humidity of the atmosphere at 65% or above.

114. In addition to wearing suitable external work clothing (as described in paragraph 112, people working with very sensitive explosives will also need to ensure that clothing worn underneath external clothing is not liable to generate electrostatic charge.

115. It is advisable not to wear gloves. Where other hazards are present and avoidance of skin contact is advised (for example when handling toxic substances) the need to wear gloves should be decided on the balance of risk. Where gloves are worn, care must be taken to ensure they comply with the general provisions of this paragraph and do not compromise the electrostatic protection system in place (for example in some situations electrically conducting surgical gloves have been used, whereas in other situations non-conducting gloves have been used).

116. Where people are required to wear conducting footwear and low-resistivity clothing, they should be given training in the care of such clothing in accordance with the manufacturer's recommendations. Where resistance monitors are used, clear operating instructions should be provided.

*Checking and maintenance of antistatic and conducting precautions*

117. An assessment will need to be made on how frequently conducting and antistatic precautions are to be checked to ensure they remain effective, for example straps should be inspected daily whereas other parts of the system may only require weekly or monthly checking. Suppliers' or manufacturers' instructions on maintenance should be adhered to.

118. Wherever antistatic or conducting precautions are being taken, it is essential that personnel working in the areas are protected from electric shock. Wherever possible, electrical systems should be protected by Residual Current Detectors (RCDs) which comply with BS 4293:1983 or BS EN 61008-1:1995, and any fixed or portable electrical equipment should be double insulated to comply with BS 2754 Class II.

119. It is essential to follow manufacturers' advice on the cleaning and polishing of anti-static or conducting floors, as incorrect techniques can adversely affect the conducting properties of the floors. As the use of such flooring increases the risk of electrocution, additional care should be exercised with maintenance and other work on electrical equipment.

120. Similar considerations need to be taken into account in the use and maintenance of worktops etc.

Information box: Further guidance is contained in the HSE publication Guidance Note PM 82 *The selection, installation and maintenance of electrical equipment for use in and around buildings containing explosives.*

### **Mechanical sparks**

Signposting box: paragraphs 121 to 126 are particularly relevant where explosives fillings are exposed and where explosives are being processed, but they are also relevant to storage of explosives substances.

121. Appropriate steps must be taken to minimise the risk from metal-to-metal contact that could create the potential for mechanical impact and friction and, as a consequence, sparks or localised heating.

122. Where it is reasonably practicable, metal surfaces should be replaced with, or covered by, a durable and chemically compatible non-metallic material. When selecting the material, consideration needs to be given to the electrostatic precautions required for the application.

123. It is not always practicable to cover the metal surfaces in process equipment (eg inside reactors, mixers, extrusion presses). In these situations, the design and maintenance of the equipment must ensure that either:

- adequate clearances are achieved between moving and static parts of the equipment; or

- durable and chemically compatible, non-ferrous metals or non-metallic materials are used at the interface between moving and static parts of the equipment.

124. Where clearances are relied upon to prevent ferrous metal-to-ferrous metal contact, adequate measures are required to prevent the accidental introduction of ferrous metal objects into the process equipment. Such measures include locking of nuts and bolts and screening explosives materials for metallic objects. Methods for doing this include the visual checking and sieving of the raw materials, or the use of induction loop or x-ray equipment.

125. Non-sparking hand tools must be used for the mechanical manipulation of explosives, for example cutting plastic igniter cord with scissors. Non-sparking materials include bronze, as well as some steel alloys. It is also preferable to use non-sparking tools in operations where there are exposed explosives or where equipment has not been decontaminated, such as in-process adjustments, maintenance operations, or when dismantling plant. Ferrous tools should only be used after a suitable risk assessment and precautions taken to avoid metal-to-metal contact; for example, the use of a steel blade to cut plastic igniter cord on a wooden (rather than a metal) surface.

126. Angle grinders and similar equipment must not be used in explosive buildings unless the buildings have been cleaned of all explosive. Such operations should be carried out under a permit-to-work or similar system (see paragraph [Error! Reference source not found. \[update paragraph reference\]](#) for more information about permits-to-work systems).

## Heat and temperature

Overview box: An important general principle in preventing accidental ignition from these sources is to keep the level of input to the lowest practical levels.

Signposting box: paragraphs 127 to 136 are particularly relevant where heating (or cooling) is used in explosives processing, but guidance is also given on heating explosives buildings.

127. Appropriate measures must be taken to ensure that explosives which are sensitive to heat do not come into unintentional contact with hot surfaces, or exposure to direct sunlight and other strong sources of illumination. Where contact is intentional (for example during processing) the temperature and period of exposure must

be controlled. Similar considerations apply where explosives gases and vapours may be present.

128. Where heat is used as part of the process (for example melting, extrusion at temperature or drying of certain explosives) the lowest practical temperature must be specified and used. In determining the appropriate temperature, a sufficient margin of safety must be maintained below the auto-ignition temperature of the explosive. The determination must take into account factors such as:

- the potential differential between measured temperature and the actual temperature of the explosive;
- the level of temperature control in the process;
- the potential for uneven delivery of heat in the process; and
- the potential for the process to heat up as a consequence of friction, shear heating etc.

129. The assessment must also consider the thermal stability of the explosive and, where necessary, a maximum time of exposure to process temperatures must be specified.

130. When drying explosives using heat, the depth of the bed must be kept to a minimum.

131. Where the explosive is a mixture, it is also important to consider and address the potential separation of the more volatile components from the mixture. Such substances may pose a much greater risk of accidental ignition than the mixture itself.

132. The process equipment and thermal control system should, wherever possible, be intrinsically safe (for example use hot water that cannot exceed 100°C, rather than steam).

133. Where appropriate, measures will be required to control condensates or sublimates. The design of process equipment and of the safe system of work should consider the potential for the condensation of vapours and sublimates on cold surfaces in and around the immediate area of the process.

134. Permanently installed, rather than portable, heating appliances are strongly recommended in explosives buildings. Electrically heated air re-circulation systems must not be used in buildings where flammable gases and vapours or explosive dusts may be present.

135. It is important to site (or guard) radiators and pipes to prevent physical contact with explosives.

Precautions should be taken to ensure that the maximum temperature of electrically heated water-filled radiators is limited either by specification or by the use of thermal cut-outs. It is also good practice to fit heating units with tamper-proof controls and an indication to show when they are energised. Radiators sited in dusty areas need to be cleaned regularly.

136. Where the explosive properties of the explosive may be affected by temperature (for example the freezing of nitro-glycerine based explosives), appropriate measures must be taken to ensure that a suitable temperature is maintained in explosives buildings so that explosives are kept within safe temperature limits. Information to help identify the effects of heat and temperature on the explosive may be obtained from the manufacturer's or supplier's Material Safety Data Sheet.

#### *Pressure*

Signposting box: paragraphs 137 to 143 are particularly relevant manufacturers of explosives and to anyone involved in the pumping of ammonium nitrate blasting intermediates.

137. It is important to keep the input of energy to the lowest practical levels (for example, using low-pressure pumps when pumping emulsions, or using the lowest pressure possible when pressing explosives).

138. Where pressure is used as part of a process involving explosives, both the safe maximum pressure and the safe rate of application of pressure must be considered. In determining the safe maximum pressure, the lowest practical pressure should be used relative to the strength of design of the process equipment (with an adequate margin of safety).

139. In determining the safe rate of application of pressure to explosives, issues to consider include:

- the friction and impact sensitiveness of the explosive;
- the potential for adiabatic heating of the explosive (for example as consequence of pumping against a dead head, or the presence of air pockets in extrusion feedstock); and
- inertia within the system (for example at the start of an extrusion cycle).

140. It may be necessary to determine a minimum safe pressure (for example a minimum pump pressure) to prevent settling or separation of slurries.

141. The application of pressure to explosive mixtures that are solid solutions (for example nitrocellulose/nitro-glycerine-based propellants) can reduce the solubility of one or more of the elements of the solution. This may result in the presence of substances that are more friction-and/or impact-sensitive than the mixture.

142. The design of extrusion process equipment should include a control system designed to prevent the specified design pressure of the equipment being exceeded (with an adequate margin of safety).

143. Those people using pumps and pumping systems will also need to consider issues covered in paragraphs 185 to 188.

### Impact and friction

Signposting box: paragraphs 144 to 146 are relevant to all types of explosive, but is of particular relevance to those storing or handling initiating explosives or pyrotechnic compositions.

144. All explosives are sensitive to impact and friction to a greater or lesser extent. Initiating explosives and pyrotechnic compositions tend to be more sensitive than ammonium nitrate-based explosives or military high explosives. All explosives require protection from impact and friction, but more care is needed for those that are more sensitive.

145. Where impact-sensitive explosives are stored or handled it is essential to:

- design work processes to avoid unnecessary nipping and squeezing of explosives that are sensitive to impact and friction;
- take care to minimise the height at which explosives are handled or stored in order to reduce the force of the impact should they be dropped;
- lay out workspaces, walkways and passageways to reduce the risk of objects being dropped on, or knocked into, explosives; and
- use special soft-floor surfaces (for example bitumen, lead) areas where explosives which are friction-and/or impact-sensitive may be handled. The electrostatic precautions required for the application need to be considered when selecting the floor-surface material. The quantity of sensitive explosives present should be reduced to the minimum necessary. The wearing of soft overshoes may also be appropriate in such areas.

146. Particular attention is needed in the design and selection of materials for hinges and lids of process equipment to minimise the risk of friction and impact during opening and closing.

### Chemical incompatibility

Signposting box: paragraphs 147 to 155 are particularly relevant in explosives manufacture, but should also be considered wherever explosives may come into contact with incompatible materials.

#### Overview

147. Incompatible substances and/or mixtures can produce significant chemical reactions. It is therefore essential to avoid unintended contact between explosives and incompatible substances, except under known and controlled conditions. In general, explosives and propellants are often found to be incompatible with such substances as acids, alkalis, strong oxidising or reducing agents, sulphur, phosphorus and strong amines.

148. Some of the principal incompatibilities, where care needs to be taken to prevent *unintended* contact, occur with:

- metal powders and water;
- picric acid and metal (particularly copper, lead and zinc);
- chlorates with, in particular, metals, acids, sulphur and phosphorus;
- azides and ammonium nitrate with copper and copper alloys; and
- contact between gassing solution acids and the chemicals used to manufacture gassing solutions. Generally, gassing chemicals should be kept away from acidic materials.

It is important to emphasise that this paragraph is not an exhaustive list of incompatible substances. Further information about incompatibilities may be obtained from manufacturers or suppliers (see paragraph 0)

149. In addition, the sensitiveness of some explosives may be affected by water or moisture.

150. Indicators of chemical incompatibility can include colour change, or gas, smoke or heat evolution. Materials intended for use in the construction of an explosive article, or in packaging likely to be in contact with explosives or propellants, may exhibit similar chemical incompatibility. Compatibility between constituents may



be assessed by thermal stability tests such as the UN Series 3(c) test and the Abel heat test scheme. Compatibility of materials of construction or packaging may be assessed by the vacuum stability test.

151. The chemical compatibility of proprietary materials such as paints, varnishes, adhesives, elastomers and lubricants will need to be assessed before they are used in direct contact with explosives. It is important to be aware that manufacturers may alter their product composition and to undertake re-testing as appropriate.

**Information box: Information on chemical incompatibilities may be obtained from manufacturers' or suppliers' materials safety data sheets and/or explosives hazard data sheets.**

#### *Precautions*

152. Steps to prevent accidental contact include:

- ensuring construction materials used are compatible with the explosives present in the building to prevent unwanted chemical reactions (for example rusty iron coming into contact with aluminium and causing a thermite reaction);
- designing and constructing drainage systems so that incompatible substances do not come into contact (either because waste products flow into a common drainage system or because the substance is incompatible with the material used in the pipework); and
- ensuring that solid waste does not enter the main drainage system and that waste materials in traps and collection devices can be removed easily. Drains or sumps should not be located under structures or process equipment. Drainage systems should also allow access for maintenance.

153. Care must also be taken to avoid contact between incompatible materials in drainage systems.

154. Other measures include:

- quality control systems aimed at detecting the presence of contaminants in materials, substances etc;
- precautions to keep explosives dry where they are sensitive to water or moisture;
- compatibility testing of all new materials that come into contact with explosives before they are used; and

- cleaning tools between jobs to ensure that incompatible explosives on tools are not transferred from one section to another.

155. It is important to bear in mind the possibility of an accident being caused by confusion between substances with similar names. Where there is a danger of this (for example sodium nitrite and sodium nitrate, or chlorate and per chlorate) then the substances should be kept well apart. Suitable measures, such as the use of colour-coded packaging and warning signs, must also be taken.

### Safe systems of work and working practices

Signposting box: This section is relevant to anyone manufacturing storing explosives.

The following paragraphs cover:

- general principles;
- housekeeping;
- stock management;
- maintenance systems;
- systems for carrying out maintenance work in explosives buildings and areas; and
- on-site transport of explosives.

Overview box: It is essential to have safe working practices and systems of work. These will depend on the nature of the operation. The safety precautions included in the safe system will depend on the results of the risk assessment.

156. There are four general principles that need to be part of the working practices of anyone storing or manufacturing explosives:

- control sources of initiation;
- where the work process involves the application of energy ensure that this is controlled;
- limit, as far as reasonably practicable, the quantity of explosive, extent and duration of exposure to the hazard; and
- limit the number of people exposed to the hazard to the minimum necessary for the process in hand.

157. Depending on the risk assessment the systems of work may also need to include other steps such as ensuring that:

- the amounts of explosive present in production areas are limited to that needed for the work in hand (see paragraph 191 to 194);
- limiting the numbers of people in explosives areas (see paragraphs 195 to 200);
- wherever reasonably practicable that sensitive explosives are desensitised during processing or storage;
- changes in the work process are not made until checks have been made to see that all the control measures remain appropriate; and
- explosives are not introduced into multi-stage processes until as late as possible.

#### *Housekeeping*

158. It is essential that explosives buildings and areas are kept clean and tidy. It is particularly important to ensure that quantities of explosive waste are kept to a minimum and that explosive waste and other dangerous material are not allowed to build up in sinks, drains etc. A system for regular cleaning and disposal must be established. Work stations should be designed so that they are easy to keep clean.

159. The quantity of flammable and combustible material in explosives areas should be kept to the minimum. All materials not necessary for the processes of manufacturing or storing explosives should be kept out of explosives buildings and areas.

160. Systems to prevent grit, dirt and foreign matter being carried on shoes into explosives buildings and areas should be used where such contamination is likely to increase the risk of accidental initiation. The traditional system involves the use of 'clean boundaries' beyond which iron-nailed boots or other outdoor or dirty shoes should not be worn unless contained in a suitable overshoe or boot. The overshoe or boot should not be placed outside the clean boundary. A system is required for sweeping of floors and disposal of sweepings to prevent the uncontrolled build up of waste explosives. Waste and contaminated materials must not be allowed to accumulate in process or storage areas.

161. Other specific measures include:

keeping escape routes clear;

- keeping floors, workbenches, shelves, clean platforms, plant and machines scrupulously clean and free from

grit and from all accumulations of explosives and explosive dust;

- cleaning protective clothing that has been contaminated with explosives. Disposable protective clothing must be removed and disposed of safely after use.

### Stock management

162. A suitable stock management system is essential. In its simplest form the stock management system will involve:

- rotating stock to ensure that the oldest stock is used first;
- checking to ensure that the stock is in good condition;
- checking the position, height and stability of stacks; condition of packaging etc.

163. Depending on the results of the risk assessment it may also be necessary to:

- ensure that incompatible items are kept separate;
- control the temperature [and humidity?];
- monitor the chemical and thermal stability of the explosives.

### *Maintenance systems*

164. It is essential to have systems in place at all manufacturing sites to ensure preventative measures are properly maintained. These should include suitable arrangements for:

- identifying safety-critical systems, plant and equipment as part of the risk assessment;
- record keeping;
- planning and prioritisation of maintenance work;
- planned preventative maintenance;
- inspection by a competent person at regular specified intervals; and
- reporting and acting on faults with systems, plant and equipment.

165. It is strongly recommended that a system of planned preventative maintenance is put in place to ensure that systems which are critical to safe operation are inspected and maintained at specific intervals.

166. It is important to bear in mind that in safety-critical applications such as explosives inspection and maintenance of equipment may need to be more frequent than manufacturers' recommendations. In some cases this may include a daily visual inspection of equipment. Only replacement parts from the manufacturer or approved supplier should be used with safety-critical equipment.

167. The maintenance regime must include a system of periodic inspections. Inspections will need to include checking safety-critical factors such as, for example, the condition of:

- the roof to ensure that it provides adequate weather protection;
- any earthing system and the arrangements to avoid static build-up;
- the floor, in particular to see that slip or trip hazards are avoided, that there are no cracks where explosives could accumulate and that conducting floors are effective; and
- the internal surfaces, particularly to ensure there are no areas of exposed iron, steel, rust etc.

168. The programme of planned preventative maintenance will need to lay down the minimum replacement intervals for key components. An assessment should be made on each such system to determine the maintenance and replacement intervals. This may be more frequent than the manufacturer recommends. A record will need to be kept for each uniquely identified pump or other safety device as well as of the inspection and maintenance schedules.

*Safe systems for carrying out maintenance work in explosives buildings and explosives areas*

169. Particular attention needs to be given to ensuring the safety of the arrangements for maintenance work itself. This includes arrangements for control and supervision. Maintenance tasks in explosives buildings and areas should generally be subject to a permit-to-work system (further information is available in HSE booklet INDG98 *Permits to work systems*). Minor modifications or adjustments to plant and equipment may be undertaken provided they are covered by specific work instructions.

170. Maintenance work may well involve the use of contractors. Particular care is needed when contractors are employed to ensure that they, and their employees, fully understand and follow safety procedures.

171. It is essential to have arrangements to ensure that maintenance staff are competent, suitably trained and have appropriate tools and equipment.

172. Equipment that produces naked light or flame (for example portable gas lights, welding equipment, matches, cigarette lighters) must not be taken into explosives buildings unless needed for repairs and specifically authorised for example by a permit to work. Suitable methods to control the introduction of such items, including the use of searches if appropriate, will need to be put in place.

173. All explosives must be removed from the building, room or area before any work involving the use of naked flames, or grinders, takes place. The area and equipment must be thoroughly cleaned. Hot work may normally only be undertaken on machinery in explosives areas where it is not practical to remove the machinery to a safe area. Before moving it to a safe area, machinery must be thoroughly cleaned. Machinery parts (such as mixing bowls) must be thoroughly cleaned and examined by a competent person, and certified as being explosives free, before they are repaired by hot work.

#### *Transporting and moving explosives on site*

174. The risk assessment will need to consider the methods of transport and the location of transport routes. When explosives need to be moved, great care should be taken to avoid situations which cause impact such as explosives being dropped (or objects dropping onto explosives), collisions or striking (for example, accidental collision between a fork-lift truck and explosives). When moving explosives which are sensitive to friction it is good practice, wherever possible, to lift rather than slide them. As with measures to reduce risks arising from impact, when addressing risks from friction it is generally good practice to minimise the energy in processes and activities by carrying them out slowly, where possible. This is particularly important where the explosive is exposed and is not contained in some finished article or package, box or other container.

175. The principle of separating sensitive explosive articles and substances from less sensitive bulk items (for example not carrying detonators with explosives) should be observed for the transport of explosives on-site. In general, mixed loads of different types of explosives on one vehicle should be avoided. The vehicle should contain only the explosives and ingredients. It should be closed or properly covered over.

176. Care should be taken with loading and unloading of explosive articles and substances onto any vehicle. Loads should be secured if necessary.

177. Consideration should be given to measures to create suitable traffic management systems on-site, such as the use of specified routes. It is important to park vehicles loaded with explosive articles and substances away from explosives buildings to avoid communication of an explosion from the building.

*Information box: Explosives being transported on road vehicles outside the site are covered by the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2004 from the time of loading to the time of unloading. This includes periods of storage on the vehicle during, for example, rest stops and intermediate temporary storage in order to change mode or means of transport. For further guidance see the HSE publication INDG 393 Working with ADR: an introduction to the carriage of dangerous goods by road.*

### **Selection of suitable work equipment**

*Signposting box: paragraphs 178 to 184 are primarily relevant to those manufacturing or storing high explosives and to those using equipment to manufacture explosives or to perform other related operations such as firework fusing.*

178. Regulation 5 of the *Provision and Use of Work Equipment Regulations 1992* requires employers to ensure that work equipment is suitable for the intended purpose. In selecting the equipment, employers must consider the risks to health and safety in the premises or undertaking and any additional risks which may arise from the use of the equipment. 'Work equipment' includes plant and other machinery and is not limited to hand tools.

179. Work equipment must be suitable for the particular conditions of explosives manufacture and storage and only that equipment authorised for use in explosives buildings should be allowed. The inherent properties of the materials must be determined before the equipment is designed or used.

180. Equipment and processes should be designed to prevent ignition through chemical reactions or excessive heat or mechanical/frictional ignition. Issues to be considered include:

- applying a hierarchy of controls, ie elimination, substitution, reduction, engineering and finally personal protection;

- using controls which fail to safety wherever reasonably practicable;
- taking into account both normal and abnormal operating conditions, including machinery breakdown or failure, maintenance, decontamination;
- ensuring equipment is suitable for use in areas containing flammable gases and vapours or explosive dusts;
- ensuring that the equipment can be thoroughly cleaned, avoiding the uncontrolled build-up of waste explosives and ensuring that there is minimal possibility of material remaining in corners and crevices. Inspection ports should be provided for cleaning and decontamination. There should be no cracks or holes where material might accumulate and be confined, for example all welds should be continuous and flush, and blind-threaded holes should be avoided if at all possible;
- avoiding contact between exposed metal surfaces or the introduction of foreign objects into moving machinery (see paragraph 181 below)
- preventing accidental contact between explosives and chemically incompatible surfaces or between explosives and exposed hot surfaces. Equipment specifications need to take into account the chemical properties of the mixtures that will be made and the compatibility of the equipment construction materials with the raw materials and products they come into contact with. It should be borne in mind that wear (for example on seals) may lead to explosives getting into moving parts or explosives becoming contaminated;
- preventing explosives coming into contact with working parts of plant such as bearings and motors by installing suitable seals and barriers. However, in some circumstances the risk assessment may conclude that it is safer to design the equipment in order to avoid the need for the fitting of seals;
- installing alarms and trips (for example low flow, high temperature) where appropriate; and
- fitting explosion relief where extraction systems are used to prevent the build up of flammable gases, vapours and explosives dusts. Such systems should be designed to allow easy access to collection traps.



181. Steps to prevent accidental metal-on-metal contact or the introduction of foreign objects into machinery include:

- ensuring sufficient clearances between moving parts both at the designed operating temperatures and at foreseeable departures from those temperatures - the clearances for use in explosives manufacture may need to be greater than for other operations;
- securing screws and other mechanical parts with wires or locking compound to prevent them from falling from the equipment into the explosives during manufacture;
- taking steps to prevent personal and protective equipment or ancillary items (for example valve keys and scoops) falling into the explosive during manufacture;
- preventing the introduction of foreign objects into moving machinery. This may include the use of filters or screens on the inlets or on tanks supplying raw materials to the manufacturing process. Filters should be designed to keep out foreign bodies such as nuts and bolts while allowing other materials to pass freely.

182. Care must be taken in the choice of equipment construction materials due to the corrosive nature of ammonium nitrate. The solvent properties of fuel oil (for example for grease) should also be taken into consideration.

183. Tools and portable equipment should be readily identifiable as authorised and controlled (for example through the use of tool lists and shadow boards).

184. Vehicles used for transport of explosives on site should be constructed of materials suitable for the type of explosive being carried in order to avoid inadvertent contamination or contact between incompatible substances.

Pumps and pumping systems **Signposting box: paragraphs 185 to 188 are particularly relevant to manufacturers of explosives and to those involved in pumping ammonium nitrate emulsions. These paragraphs should be read in conjunction with paragraphs 137 to 143.**

185. The selection and design of pumps must take into account:

- the potential for, and consequences of, a failure of a pump part or a hard object entering the pump;
- the need to ensure that the material used in the construction of the pump are compatible with the explosive being pumped;

- prevention of continuous friction leading to a heating of a stagnant pocket of explosives;
- discontinuous feed of explosive to the pump leading to the inclusion of air pockets in the feed which could be subject to compression heating;
- collapse of a feed hose leading to starvation of the pump;
- the chemical and explosive properties of the material to be pumped - ie its minimum burning pressure, friction and thermal sensitivity; and
- the operating parameters of the chosen pump - for example torque and operating temperature and pressure.

186. Pumps should be fitted with appropriate pressure and temperature gauges, no-flow meters and associated alarms. It is essential that any instrumentation is located at appropriate positions ie pressure measurement as close as reasonably practicable (taking into account the location of other instrumentation) to the delivery outlet of the pump.

187. The maximum safe operating pressure of the pumping system will need to be determined and measures put into place to ensure pressure is controlled within specified levels, for example by fitting an appropriately rated bursting disc as near as reasonably practicable to the delivery of the pump to prevent operation outside specified limits.

188. It is essential that pumps used for handling explosives are protected to prevent them running dry (ie continuing to run when there is no product to pump) or deadhead pumping (ie pumping against a complete blockage). Both events will result in localised heating which in turn can result in an explosion in the pump. One option is to use diaphragm pumps, which will stall in these situations. Alternatively, trips should be fitted to discontinue pumping automatically if either:

- there is a 'no-flow' of product in the pump because of blockage or product starvation; or
- the pump exceeds the design running temperature or maximum running pressure.

**CAN THESE PARAGRAPHS BE INTEGRATED? MEASURES TO LIMIT THE EXTENT OF A FIRE OR EXPLOSION (REGULATION 4(1)B)**

**ACOP**

**This section is relevant to anyone with duties under this regulation.**

Overview box: As well as taking steps to prevent a fire or explosion occurring, Regulation 4 also requires anyone storing explosives to take steps to limit the severity of the consequences in the event of a fire or explosion. At its simplest this will involve:

- managing stocks of explosive to limit the amount of explosive in areas in which people are likely to be present;
- limiting the number of people in areas where explosives are present;
- keeping explosives away from flammable or combustible materials which could fuel a fire, and away from toxic substances which could be released in the event of a fire.

In other situations, particularly in manufacturing, it may also be necessary to take other steps to contain and safely release the blast effects.

#### *Separation of storage and other areas*

189. A key measure to reduce the severity of an explosion is to separate storage buildings from production buildings. The aim is to ensure that an explosion which takes place in a production area (where the risk of an explosion is greatest) does not propagate to storage buildings (where the greatest amount of explosive substances or articles is kept and therefore the hazard is greatest).

190. HSE licences require distances to be maintained between process buildings and other explosives buildings ('process building' distances) and between explosives stores ('inter-magazine' distances). Annex 3, Tables 1 and 2 give indicative distances for information. The distance specified will depend on the layout of the site and other factors. Licence applicants should contact HSE for specific advice. The inter-magazine distances in Annex 3, Table 1 must also be maintained at any explosive site licensed by a local licensing authority where there is more than one explosives building.

#### *Limiting the quantity of explosive in production areas*

191. In line with this principle, it is essential to make arrangements to ensure that the quantity of explosives in production areas is limited to that needed for the work in hand, and finished explosives are removed as soon as possible after production. Explosives in production processes can present higher risks due to the lack of packaging, exposed explosive substances or because they

have not been fully purified. They should not be stored with the finished product.

192. Where it is necessary to keep explosives in production buildings they must be kept in boxes or other containers which are designed to withstand the initiation of adjacent explosives or alternatively kept in separate, designated, storage areas.

193. There are circumstances, such as the packing of firework selection boxes, where it may be necessary to have finished explosives or explosive articles in a production area. The same basic principles apply in these circumstances: stocks must be planned and managed with the aim of keeping the quantities of explosive in production areas to that needed for the job in hand.

194. Ingredients with explosive properties, or those which, when mixed with other ingredients in the building, are capable of forming an explosive mixture or compound, should also be removed from the building as soon as the process involving those ingredients is completed.

195. Limiting the numbers of people in explosives areasAs a general principle, the numbers of workers in explosives areas should be kept to the minimum needed to carry out the work safely. It is recommended that signs and notices are placed on doors or at other appropriate places indicating the maximum number of people permitted in the area at any one time.

196. The number of visitors at any one time in an explosives building should be kept to a minimum.

#### *Controlled areas*

197. Measures to restrict access will normally be required for buildings or areas used for:

- remote manufacturing; and
- manufacture or storage of particularly sensitive explosives.

198. The control measures needed depend on the circumstances, including the process, level of hazard etc. Appropriate measures might range from simple signs stating who may or may not enter a low-hazard area through to physical barriers and surveillance systems (in specific limited circumstances) to control entry to particularly hazardous areas. Where barriers are used they should be interlocked to prevent people being present when the process is in operation.

#### *Containment and safe release of blast effects*

199. For very small quantities of explosives it is possible to completely contain the effects of a fire or explosion within the work area, machine etc. This is the case, for example, when manufacturing and loading small explosive articles such as small high-explosive caps, some pressing of small pyrotechnic articles, and detonators. Where larger quantities of explosives are involved, it may not be practicable to contain the effects to the immediate work area. In such cases the design and construction of the building itself, and of areas around it, will need to be done with the aim of controlling the direction of blast, flame, debris etc away from people, other buildings, roads etc.

200. It is essential that workplaces are designed to prevent the propagation of fire and explosion from explosives located in one area to those in another. Where appropriate, this may, for example, include the use of "airlocks", detonation traps, drenching systems etc.

## **PART 2: PROTECTING PEOPLE FROM THE EFFECTS OF FIRE OR EXPLOSION (REGULATION 4(1)(C))**

201. As well as requiring anyone manufacturing or storing explosives to take steps to prevent a fire or explosion and to prevent the fire spreading and/or limit the size of any explosion, Regulation 4 also requires them to take steps to prevent people in the event of a fire or explosion.

202. At its simplest this means taking steps to ensure that in the event of a fire anyone in the immediate area of the explosives can quickly and safely escape.

### **Protection measures**

#### **Emergency procedures**

#### **Guidance**

Information box: The Management of Health and Safety at Work Regulations 1999 require the establishment of procedures to be followed in situations presenting serious and imminent danger. Certain sites where very large quantities of hazardous substances including explosives are present are subject to the requirements of the Control of Major Accident Hazard Regulations 1999. Those regulations contain requirements for the preparation of on-site and off-site emergency plans. Further guidance is given in *Emergency Planning for Major Accidents* ISBN 0 7176 1695 9.

Needs an overview paragraph?

#### **ACOP**

203. The procedures must clearly set out what employees and others should and should not do in an emergency. The procedures must normally be written down. Information on the procedures must be provided to all employees. It must be stressed that this does not necessarily require extensive documentation: in a small shop the emergency procedures might consist of evacuating the shop and calling the fire service. In such a case the documentation might involve no more than a written notice displayed prominently where all staff will see it.

204. In manufacturing and similar situations the procedures may need to be more extensive and will need to set out:

- responsibilities of individual employees where they have specific tasks to perform (such as shutting down plant);
- the role and responsibilities of people nominated to implement detailed actions;
- any requirements laid on employers by health and safety regulations which cover some specific emergency situations;
- the provision of suitable first-aid facilities (including appropriately trained first-aiders) taking account of the likely effects of any accident, incident or emergency; and
- when and how the procedures are to be activated.

205. It is essential that the information given to personnel includes clear guidance on situations when they must stop work and how they should move to a place of safety. Arrangements should include procedures for assisting particular groups of people such as members of the public or other visitors on site (who may be unfamiliar with the workplace and the risks presented by dangerous substances that are present), or disabled employees. The guidance will draw on the risk assessment and identify:

- when work must stop (for example in the event of fire, equipment malfunction, loss of containment or in other cases which could lead to accidental initiation);
- what escape routes to take to leave quickly and safely;
- where people should assemble after evacuation; and
- who will tell them if and when it is safe to return to work.

206. It is essential to carry out exercises to familiarise employees with the procedures and to test their effectiveness. Procedures must be reviewed if test results suggest it is necessary to do so.

## ACOP

### Fire precautions

**[Check following references to fire regulations still current]**

Information box: other relevant regulations include:

- the Fire Precautions (Workplace) Regulations 1999, which contain requirements for a fire risk assessment and a management document, aim to reduce risk and provide general fire precautions for the safety of employees, taking into account the duty of care of those employees to other people;
- the Fire Precautions Act 1971, which requires offices, factories and shops employing more than 20 people to hold a fire certificate. Factories employing less than 20 people may also be required to hold a fire certificate if they hold a quantity of flammable or explosive material which could pose a serious additional risk to persons in the event of a fire; and
- the Fire Certificates (Special Premises) Regulations 1976, which contain requirements that apply to explosives factories and stores licensed by HSE.

At the time of writing (2004) the Government was in the process of introducing new regulations on which would replace these requirements above in favour of a risk-based regime which applies to all workplaces and other places to which people go.

207. The fire precautions required will depend on the complexity of the site, the type of material being kept, the processes being conducted and the results of the risk assessment. At their simplest the fire precautions will consist of ensuring that the explosives are not stored anywhere where in the event of a fire they would endanger the escape routes and that they are kept well away from flammable and hazardous substances. Common fire-precaution principles to consider in the design of the workplace and systems of work include:

- removing any features that would assist the rapid development of a fire;
- locating the process operation or storage away from escape routes. They should also be kept away from vertical openings which might spread smoke or fire

through buildings (in some cases openings may be specifically designed to vent heat and flame away from escape routes etc); and

- proper maintenance, testing and examination, at regular intervals, of the means of escape, fire-fighting equipment and fire-warning systems, and the keeping of records.

208. When considering fire precautions, it is important to assess the particular fire hazards that may arise from the process or activity being carried out, as these may vary from one situation to another. This includes:

- ensuring that people are not prevented from escaping by toxic fume, flame or radiant heat in areas where there are potential leakage and ignition sources;
- identifying the places people need to go during normal plant operation or maintenance and the means provided to allow them to enter or leave these places; and
- considering potential hazards arising from the form of construction and materials used for the structure and finish of the building. For example, unprotected openings in walls and vertical shafts may help the spread of smoke and therefore hinder escape, and unsuitable lining surfaces of walls and ceilings can lead to the rapid spread of flame.

#### Fire detection and warning systems

209. A means of raising the alarm in case of fire is required. It may also be appropriate to install a fire detection system. This may be appropriate where processes are left unattended or where occupants in a large building may not be aware of fire developing in another part of the building. The fire-warning system and detection system (where fitted) should be suitable for the site and will vary depending on the operation or process being carried out and should be appropriate to the level of risk presented. For example, these may range from the installation of a smoke alarm in a shop storing a small quantity of fireworks, to the use of detectors linked to automatic water drench systems in certain manufacturing processes.

210. Where an automated warning system is used, a manually operated fire-warning system, linked into the automatic system, will also be required so that workers are able to activate the alarm in the event of an emergency.

211. The type of system, including the siting of alarm-actuating points, will vary depending on the size of the



site and the size, number, construction and use of the buildings on the site. Advice on the type of system and actuating points may be sought from competent designers or suppliers.

## Means of escape and evacuation

### *General principles*

212. All explosives buildings and areas must be designed to allow people to escape quickly. [moved] It is essential that, in the event of fire, people can reach a place of safety quickly. This is a place that is either well away from the fire, or protected by a fire-resisting structure with not less than 30 minutes protection. As a general rule, the greater the risk to which people are exposed, the shorter the escape route should be.

213. It should be emphasised that in the event of fire, the hazards may include smoke and hot toxic gases, as well as flames, and the danger is exacerbated by the speed at which these may spread through a building.

214. Exit doors must open outwards, are easily pushed open and are accessible without the use of a key while the building is occupied. Exit doors must never be blocked. There should be a flat area of at least one metre immediately around the outside of the exit door. All escape routes and exits must be clearly marked.

215. Fire alarm-actuating devices should normally be situated at the exit(s) from the building and should preferably be capable of immediate activation (for example a push button, not a break-glass type). Alarms should be located at a safe place or on evacuation routes at a safe distance. BS 5839-1:2002 *Fire detection and fire alarm systems for buildings* provides recommendations for the planning, design, installation, commissioning and maintenance of fire-detection and alarm systems in buildings other than dwellings.

### *Escape routes*

216. Where there is risk of blast or fireball, plans and arrangements for escape and evacuation from explosives buildings must take into account the fact that workers escaping from a building may still be in immediate danger from blast and fragments thrown by the exploding building or from the fireball. Issues which will need to be taken into account include:

- escape routes. These should be clearly marked and appropriately lit. Consideration should be given to 'dog legs' and pressure relief areas to divert blast pressure away from those escaping a building;

- the location of muster areas. These should be clearly identified. Fire blankets and other fire and first-aid equipment should be available at or readily accessible from these areas.

217. Evacuation plans and procedures will need to take into account the possibility that in the event of a fire in one building, workers in other buildings may be at less risk if they stay indoors.

*Exits in buildings storing explosives*

218. In explosives stores, the distance between the occupants and exit(s) should not normally be more than 30 metres.

*Exits in manufacturing buildings*

219. When granting certificates under the Fire Certificates (Special Premises) Regulations 1976, HSE normally requires that there are two exits in buildings or areas where explosives are being manufactured. Where two or more exits are provided they should preferably be sited far enough apart so that if one exit is threatened by fire, the other exit (or exits) is not.

220. Working processes must be designed to ensure that there are no explosive compositions or materials between the worker and exits that could hinder or prevent escape.

221. It is recommended that the travel distance between the occupant and the exit (or protected route) is limited to not more than 6 m. Where only one exit is provided, this distance should not be more than 4 m, and explosives must not be kept between the occupant and the exit (or protected route).

222. In firework process areas the spread of fire is likely to be rapid and travel distances must be very short, with dead ends not normally accepted. The exception is where cell-type construction is used, and the operator is between the workbench and the exit, with a travel distance of no more than a pace or two.

*External plant*

223. Some sites may include external plant (ie where the plant is either not enclosed or is only partially enclosed for weather protection). For people working at external plant the main dangers are likely to be the rapid engulfment in flames and the effects of radiant heat, rather than smoke logging. Operators must be able to move quickly away. Generally a minimum of two escape routes are required, sited so that they are clear alternatives (ie not likely to both be involved in the

same initial fire). Where it is not reasonably practicable to provide more than one exit, travel distances must be kept short. It is generally not necessary or practicable to construct protected routes from external plant.

224. In some cases it may be safer for people working at high level at external plant to escape at high level, rather than to return immediately to ground level.

## **Firefighting**

### **Guidance to fire services**

225. Fire services may wish to consider in advance in what circumstances they would or would not fight a fire. Firefighting action should generally be limited to preventing the fire spreading to buildings or areas containing explosives, or to fighting secondary fires after an explosion. In general, the fire services should withdraw to a safe distance if the fire should spread to a building known to contain explosives, or other similarly hazardous materials. If there is any doubt about the nature or location of the explosives involved, the fire should not be fought and the fire service should withdraw to a safe distance. Fires that have spread to buildings or areas holding HT1, HT2 or HT3 explosives must not be fought.

### **ACOP**

226. As a general rule, the priority in the event of a fire will be to evacuate people to a place of safety. Anyone detecting a fire involving explosives should evacuate the area immediately and raise the alarm.

227. It is important to emphasise in any training and information that staff:

- tackle fires only when it is safe to do so and only after receiving appropriate training in the use of the fire-fighting equipment; and
- that fighting large fires is dangerous and that workers should only tackle small fires and certainly not those that have gained a firm hold or involve explosives.

The training and information will also need to cover:

- the number, type and location of fire-fighting equipment stored in the premises and elsewhere; and
- the type(s) and location of fire-warning systems.

228. Appropriately trained on-site personnel may use fire-fighting equipment to prevent external fires

reaching stocks of explosives, but only when they can do so without endangering themselves or others. It is essential that staff do not put themselves or others at risk by attempting to fight fires unless this is necessary to protect escape routes, or unless fires are small enough to be brought under control easily.

229. In certain cases, where there is an experienced works fire-fighting team, the team may fight larger fires that do not pose an immediate threat to the explosives.

230. It is essential to avoid the potential danger from prolonged attempts at fire-fighting. In particular, fire fighting must not continue when the means of escape are threatened. It is also extremely important, having left the vicinity of a fire, that people should not return to fight it.

231. If there is any danger that the fire will affect any explosives present, those fighting the fire must evacuate the area immediately.

#### *Liaison with fire services*

232. Information on the buildings where explosives are present, and the explosives involved, should be prepared in advance and be provided to the fire services in the event of a fire. Fire services should be contacted and may wish to undertake familiarisation visits to explosives sites. A competent person should be appointed to advise the fire service, in the event of an incident. On arrival the fire service should be told where the fire is located and the hazards involved.

#### *Firefighting equipment*

233. In carrying out the risk assessment consideration should be given to whether equipment should be provided for fighting fires at an early stage in order to assist with escape and evacuation. [Advice for the little guy? Ask Harry E?]

234. The only fire-fighting equipment usually required in explosives buildings is equipment for fighting small fires and to ensure that means of escape can be safely used. Fire-fighting equipment should not generally be provided in pyrotechnic process areas and need not be provided in stores. However, in certain circumstances consideration will need to be given to providing fixed automatic water drench facilities. An example of where it might be necessary to provide such a system is at an automated manufacturing/loading facility which is attended, and where significant quantities of pyrotechnic material are in process.

235. Where firefighting equipment is provided, it is essential that it conforms to British Standard BS 5306 Code of practice for fire extinguishing installations and equipment on premises. BS 5306 also provides guidance on the selection, sizing and location of fire fighting equipment.

236. All firefighting equipment must be suitably maintained and checked at regular intervals. Records should be kept of maintenance and checks carried out. The equipment must be kept in a state ready for immediate use.

237. It is also essential to recognise the dangers of using the wrong type of fire extinguishers on certain fires and to prohibit certain fire extinguishers in buildings containing certain fire hazards. Incorrect fire fighting methods can dramatically increase the severity and effect of a small fire. This is particularly the case with the use of water on:

- powdered aluminium;
- fires involving liquids such as oils; and
- molten metal fires.

*Check again - advice normally water extinguishers preferable for fireworks? If yes look again at this paragraph/section*

*Firefighting and emergency arrangements for ammonium nitrate and ammonium nitrate emulsions*

238. The local fire authority should be informed that ammonium nitrate, or ammonium nitrate emulsions, are being stored. Arrangements should be agreed for giving early warning of a fire, providing suitable access to the site and ensuring that there is an adequate supply of water available to tackle an incident. Additional safeguards may be necessary at some sites which are close to neighbouring buildings. These may include automatic fire detection or a fixed deluge system.

239. Where there are homes or businesses in the immediate area, the emergency plans will need to include arrangements for alerting and evacuating those off the site who would be at risk in the event of a fire or explosion (including those at risk from toxic fumes). These arrangements will need to cover periods when the site itself is unattended.

240. Employees need to be trained and practiced in the actions to take in the event of a fire. This includes using portable fire-fighting equipment in the fire's early stages. Portable water fire extinguishers or fire

hose reels are appropriate where ammonium nitrate or emulsions are, or might be, involved.

241. To enable employees to deal with such incidents, they need to receive specific training to ensure that they do not put themselves at risk of breathing fumes from decomposing ammonium nitrate. The effects of the inhalation of these fumes may be delayed and immediate medical help should be called.

#### Re-entry and resumption of work

242. Re-entry after an incident, and the resumption of work, must only be permitted when directed by a competent person appointed by the site operator. Where there has been a major incident involving the call out of the fire service, entry to the premises should be prohibited until the fire service has given the all clear. Any work involving potentially hazardous situations after an incident (for example dealing with smouldering explosives, opening of vessels, sealed work equipment) must only be undertaken under the supervision and direction of a competent person. It should be borne in mind that certain explosives could still detonate even if they are submerged in water.

#### Protection against explosion

**This section is primarily relevant to those involved in manufacturing operations such as....**

243. Depending on the conclusions of the risk assessment, measures to protect people in the event of a fire or explosion include the use of safety screens and barriers, remote working, and personal protective equipment, or a combination of these.

244. The protection measures required will depend on the likelihood of ignition and the potential to harm people, if ignition occurs. As a general rule, this means that where it is foreseeable that ignition may occur:

- remote working will be required in cases where the potential for serious injury or death is significant;
- depending on the activity being undertaken, safety screens and personal protective equipment will be required in cases where the potential for serious injury is low.

245. It is essential to protect the operator handling the substance or article. Protection of hands and eyes is particularly important. The precautions will need to be judged, but often this can be helped by deliberately and safely initiating the substance or article and observing

the potential for harm, perhaps using mannequins as targets.

*Remote working*

246. Certain explosives, propellants and pyrotechnics manufacturing processes carry such a serious risk of fire and/or explosion, that even though the risk of initiation has been reduced as low as is reasonably practicable the risk of injury to an operative is higher than the tolerable level of risk. Such operations must be carried out remotely.

247. The following are examples of explosives operations for which remote operations will normally need to be considered, depending on the type of explosive, sensitivity and likelihood of ignition, nature of the process (including confinement etc) and the quantities involved:

- the manufacture of primary explosives;
- incorporation of pyrotechnic compositions;
- mixing and handling of propellants and blasting explosives;
- medium-and large-calibre ammunition shell filling;
- making detonators;
- propellant extrusion/pressing;
- pressing and subsequent handling of MTV flare compositions.

248. Before deciding on whether to use remote working an assessment should be made of the likelihood of initiation and the potential for harm to operators if an initiation were to occur. The assessment will need to cover the hazards/sensitiveness of the raw materials, intermediates and finished product, as well as the effects of elevated temperature, pressure, or increased confinement. In some cases, it may be necessary to carry out tests and trials to gain the information needed.

249. Remote working must be used where the assessment of an operation shows both the potential to kill or seriously injure and significant likelihood of initiation.

250. Safeguards must be put in place to prevent access to the remote process area during manufacture and physical barriers must be used for this purpose. The 'captive key' (eg Castell Key) type of interlock system is an effective method for securing entrances to fenced-off manufacturing areas. The safeguards should be arranged to either

isolate the power supply positively or control to the manufacturing unit if any of the entrances are open. Surveillance by camera and/or infrared detectors may also be necessary.

#### *Safety screens*

251. In some low-hazard operations a foreseeable likelihood of initiation remains, and safety screens are needed to protect the operator. The use of transparent shields is desirable to allow the operator to observe the operation process, and materials such as polymethyl methacrylate and polycarbonate are available for such purposes (although it is important to recognise that such materials are susceptible to the build-up of static electricity) although in some instances, the use of closed-circuit television or mirrors may be appropriate. Laminated safety glass held in a steel plate assembly offers a strong barrier protection. It is important to ensure that the shielding arrangement is firmly anchored, and that the screen provides the necessary protection to people who are nearby. It may be necessary to perform type-tests on the substances or articles being handled in conjunction with the proposed screen arrangement.

252. While safety screens can provide effective protection to the head and torso, the hands and arms are likely to remain vulnerable. The screens will therefore need to be used in conjunction with other equipment such as gauntlets and kit sticks.

253. People using a safety screen for head and body protection while manipulating very sensitive explosives substances or articles require, in addition, suitable hand and wrist protection. Suitable fire-resistant gloves provide protection against burns from pyrotechnics. Suitable gloves may also provide protection against potential blast and fragment injuries.

254. Guarded tools such as 'kit-sticks', guarded tweezers, pneumatic or suction devices may be more practicable where a certain amount of manual dexterity is required. Even with the use of such devices it is necessary to provide wrist protection such as leather armlets.

255. Where a high degree of manual dexterity is required, and the use of gloves or tools is not practicable, the only viable option is to redesign the process. This may involve using extremely small quantities, together with systems of work designed to ensure that any explosion is directed away from the hands (appropriate training and supervision are essential where such systems are used).



It may also be necessary to consider eliminating the operation altogether.

#### *Personal protective equipment*

256. Personal protective equipment is only appropriate as a last line of protection and should not be relied upon where protection would be better provided by engineering solutions, or by using safer systems of work. Where the risk assessment shows that the consequences of initiation of the materials is slight, but the likelihood of initiation is significant, careful consideration must be given as to whether the operation is acceptable taking into account the quantity of explosive involved, its sensitiveness and precautions taken, or whether a safer substitute used.

257. The personal protective equipment must be suitable for explosives use, correctly fitted and maintained and properly used. Suitable training must be given in its use.

#### *Eye protection*

258. Eye protection must be worn when sensitive explosive substances are handled openly (in very small quantities) such as in a laboratory. Eye protection must be worn regardless of any other shielding which may be provided. In considering whether safety glasses, goggles or face shields are used, the following points should be borne in mind:

- safety glasses are only suitable where the risk is confined to minor deflagrations and where protection against dust is not required. Safety glasses with side shields are preferred as they offer more protection;
- goggles protect the eyes and orbital cavities and are effective for low-and medium-energy impact and for protection against dust;
- face shields provide both eye and face protection and are suitable for all impact categories but normally do not provide protection against dust; and
- vapours, gases, hot or corrosive liquids, heat and light may also be significant hazards to be taken into account in the selection of eye protection.

259. Eye protection designed for use in general industry may not be designed to withstand the forces which could be generated by an explosion. It is essential to check whether the equipment is suitable for use in an explosives context. Guidance on this is contained in HSE guidance IND 174 *A short guide to the Personal Protective Equipment at Work Regulations 1992*.

### *Clothing*

260. In general, it is recommended that overalls of fire-resistant cotton are used. Where workers face a significant risk of burns, they must be issued with suitable fire-resistant protective clothing which may need to be of a higher specification.

261. Depending on the results of the risk assessment, precautions may be required to avoid accidental transfer of incompatible substances from one explosives area to another on, for example, gloves or overshoes. An appropriate precaution would be to have specific personal protective equipment dedicated for use in specific processes.

### *Design of nearby buildings*

262. The design of nearby buildings where explosives are not present and, in particular, control rooms, will need to provide reasonable protection to people inside from the effects of an explosion in the vicinity.

Information box: Further guidance on protective measures (other than personal protective equipment) is available in the CBI Explosives Industry Group publication *Protective measures* (ISBN 0 85201 572 0). Further guidance on personal protective equipment is available in the CBI Explosives Industry Group publication *Head and eye protection*.

## **PART 4**

Signposting box: this part includes additional guidance for those involved in particular activities. This includes guidance on:

- storage of fireworks and other pyrotechnic articles;
- storage of other explosives;
- storage of ammonium nitrate and ammonium nitrate blasting intermediates;
- firework fusing.

## **STORAGE OF EXPLOSIVES**

Overview Box: The first part of the following section gives an overview of common principles for the storage of explosives and then provides a further specific Approved Code of Practice aimed at those people involved in particular processes; ie the storage and display of pyrotechnic articles in shops and other premises; the storage of car air bags and seatbelt pre-tensioners; the

storage of pyrotechnic articles other than in shops; and the storage of other explosives.

The second part gives a description of suitable places of storage for explosives.

The third part covers the storage of ammonium nitrate, ammonium nitrate and fuel oil and ammonium nitrate emulsions; and the mixing of emulsion explosives and ANFO.

The final part covers the fusing of fireworks.

### *Overview of common principles*

Overview box: A number of common principles should be applied to the safe storage of explosives. These are summarised here. Detailed guidance on the principles and measures may be found elsewhere in this document.

The common principles are to:

- protect explosives from sources of ignition;
- prevent fire and explosion spreading;
- avoid unsuitable storage conditions;
- ensure accurate control and record-keeping arrangements.

### **ACOP**

263. All explosives must be stored in a suitable place. The nature of the place of keeping will depend on the quantity and type of explosive being kept. However, a number of key principles apply to the safe storage of explosives, regardless of the type of store or place where they are being kept. The principles are covered in detail elsewhere in this document but in summary they include ensuring that the store, storage area, container or cupboard is, where appropriate:

- suitably weatherproof;
- ensuring that explosives do not come into contact with substances with which they are incompatible; ;
- protected by a lightning conductor, where appropriate (see paragraphs 102 to 107);
- used only to keep explosives and tools or implements connected with the keeping of explosives; and
- kept clean, with steps taken to prevent grit entering unpackaged explosives.

### *Protecting explosives from sources of ignition*

264. Suitable precautions must be taken to exclude possible sources of ignition. Details of these sources and precautions are given elsewhere but in summary, these include excluding:

- naked flames, including matches, lighters, smoking materials etc
- where appropriate, sources of electrical energy and radio energy (including mobile phones, pagers etc) which could induce stray electric currents in certain circumstances;
- grit, rust and other contaminants; and
- incompatible materials.

265. Further precautions include ensuring that:

- not using or keeping portable heaters in the store;
- ensuring that the store is thoroughly cleaned before the start of maintenance work and that only non-sparking tools and implements are used unless the plant or equipment has been cleaned or is otherwise free from contamination by explosives; and
- if it is necessary to use flammable materials in the store, for example for maintenance work, they must only be taken in for immediate use and then removed straight away.

**[Need to check over this section for duplication]**

**[If the following 2 paragraphs are retained, the status as guidance looks odd – should be ACOP?]**

#### *Preventing fire and explosion spreading*

266. Measures to prevent fire and explosion spreading will include segregation high-risk materials from lower-risk explosives. This will involve segregation of:

- detonators;
- 'in-process' unstable or sensitive explosives from finished products;
- suspect or deteriorated explosives;
- out-of-life explosives;
- development products or samples;
- any other explosives or materials where accepted compatibility issues arise.

#### *Other safety precautions*

267. Other safety precautions will include:

- ensuring that confinement does not increase hazard (for example certain Hazard Type 3 propellants may under confinement behave as Hazard Type 1); and
- not storing explosives with other hazardous goods (for example flammable liquids, solids, reactive substances).

## **Storing Hazard type 4 pyrotechnic articles**

### **Guidance**

**This section needs to be called up more in the preceding sections.**

#### ***Introduction***

Signposting box: The following sections of the ACOP and guidance cover the storage of Hazard Type 4 pyrotechnic articles, and other similar Hazard Type 4 explosives. It is relevant to anyone storing this type of explosive although specific guidance is given on the particular issues that need to be considered in shops (including supermarkets, DIY 'superstores' and garden centres, etc) where quantities of fireworks are stored/displayed in places to which the public have access

Information box? Hazard Type 4 pyrotechnic articles include items such as consumer fireworks, flares, smoke signals, cable cutters, explosive rivets, toy caps, party poppers and cracker snaps in bulk for Christmas crackers. While strictly not pyrotechnic articles, some other Hazard Type 4 explosives, such as small arms ammunition and nailgun cartridges, may be treated in a similar way when kept in shops and other premises. For simplicity, in the following sections, the term 'pyrotechnic article(s)' is used to cover both 'true' pyrotechnic articles and other Hazard Type 4 explosives.

#### ***Fire safety regulations***

**268.** As well as duties under these Regulations anyone storing pyrotechnics and other explosives articles will have duties under the Fire Safety Regulations. These duties include arranging for a competent person to carry out a risk assessment to identify risks to the public, employees and firefighters. It is essential that the risk assessment takes into account the presence of fireworks in the premises. If the assessment is carried out at a time of year when there are no pyrotechnics on the premises, then the person carrying out the risk assessment should be told that pyrotechnics are present at certain times of the year.

**269.** It is equally essential that the storage arrangements for pyrotechnics take account of the advice of the person carrying out the risk assessment who will

have had the opportunity to consider all the circumstances at the site, including in particular any additional fire loading from, for example, the presence of highly flammable liquids.

## **ACOP**

### *General precautions*

270. The basic principles for the display, storage and handling of pyrotechnic articles in retail and other premises (such as cash and carry stores) are the same as for other types of explosive. Those storing these articles must carry out a risk assessment and take the appropriate measures to control the risks identified by the risk assessment. These measures include:

- storing pyrotechnic articles well away from flammable liquids and materials that can easily catch fire and burn; and
- controlling the quantities being stored, handled or displayed in areas where people work or gather. This is obviously especially relevant to the shopfloor area of shops;
- prohibiting smoking anywhere near the stored fireworks or other pyrotechnic articles;
- ensuring that sources of heat, such as space heaters, are kept well away from the fireworks or other pyrotechnics;
- keeping the fireworks and pyrotechnic articles in closed transport containers;
- storing the fireworks and other pyrotechnic articles away from hazardous substances;
- protecting the articles from damp; and
- ensuring that other chemicals do not contaminate the articles.

### *Preventing the spread of fire from/or to flammable or other dangerous substances.*

271. It is preferable to keep pyrotechnic articles in a storage place that can be used exclusively for this purpose. A fire involving pyrotechnic articles is likely to spread very quickly as burning projectiles are thrown around. Where the pyrotechnics are kept in a warehouse (or similar room or building) that also holds significant quantities of other combustible materials, the storage arrangements will need to be designed to prevent the spread of fire by fragment throw. This will involve either:

- storing in an ISO transport container (or similar fully-enclosed metal structure);
- using storage cupboards or cabinets;
- building a structural partition; or
- using a wire mesh screen or cage.

It is important to stress that the safety measures must be seen as a whole. Any container or enclosure must be:

- suitably constructed - it must be sufficiently robust to remain stable and effective throughout its expected working life taking into account the expected working conditions;
- suitably located - it must be located well away from flammable or hazardous substances. For example, in the warehouse of a DIY superstore it should be located in the area of the warehouse used to store inert non-combustible building materials or gardening products (eg sand and cement or compost).

272. There must be a fire-resisting separation (for example, a breeze block, stud partition or other suitably constructed wall capable of resisting fire for at least half an hour) between the store (or warehouse containing the store) and the sales area.

273. Where pyrotechnic articles are kept in a store used exclusively for this purpose, the transport packaging alone may be considered to provide sufficient protection providing that the safety measures set out in the following two paragraphs are taken.

274. The transport packages must not be left opened in the storage area. The packages should normally only be opened when needed (or if the contents are to be transferred to a storage cupboard or cabinet). After opening, it is important to close the flaps securely if pyrotechnic articles remain in the package (for example, by taping the flaps down; interleaving the flaps; or securing them in some other way to ensure that the flaps do not open).

275. It is also important to avoid transferring pyrotechnic articles from one transport package to another in order to avoid the spillage of explosives.

276. Where it is not possible to reserve a place exclusively for the storage of pyrotechnic articles, then ideally, the bulk of the articles should be away from the shop premises. Where this is not feasible, the pyrotechnic articles must be kept (preferably in their

closed transport packaging) in a fire-resistant cabinet or container.

277. It is not good practice to decant loose pyrotechnic articles into metal dustbins. There is a danger that the articles will become mixed up or damaged, with loose compound collecting at the bottom of the dustbin. In addition, in the event of a fire, a dustbin does not offer good protection from heat transfer.

278. Under no circumstances should the pyrotechnic articles be kept anywhere where, in the event of a fire, they might endanger the safety of those using escape routes from the building. Pyrotechnic articles must not be stored anywhere where, in the event of a fire, the fire could quickly spread, from or to, any other flammable materials or materials that can easily catch fire (for example, white spirit, barbeque-lighting fluid, paint thinners or other flammable liquids, matches, firelighters) or materials that can easily catch fire (for example, bulk quantities of paper, cardboard, surplus wooden pallets, video tapes, tights or stockings).

279. It is advisable to restrict entry to the room or store used for storage of the fireworks to those members of staff who need to be there.

#### *Housekeeping and stock management*

280. It is important that the storage area is kept clean of any loose powder and that unwanted empty packaging and other combustible waste materials are removed straight away when they are no longer required.

281. Damp pyrotechnic articles can be dangerous, especially to users. It is therefore very important to ensure that appropriate measures are taken to keep them dry.

282. It is also important to manage stocks to avoid the need to repack fireworks. However, it is a good idea to retain some of the empty transport packages so that any unsold fireworks can be repacked in the appropriate transport packaging for return to the supplier (if the items have been supplied on sale or return) or transport to the site where they are to be disposed of. There are legal requirements on the packaging of pyrotechnic articles for transport and if in doubt advice from the supplier must always be sought on how unsold articles should be repackaged for transport.

include a box with 'dos' and 'don'ts'.

#### *Other safety measures*



283. As well as the risk from fire, it is also essential to bear in mind that certain other chemicals may be hazardous where there is a risk of chemical contamination or an additional explosion hazard. They should therefore be stored far enough away from pyrotechnic articles that there is no risk of contamination.

284. Examples of products that could present a contamination hazard include:

- products containing caustic substances (acids or alkalis) such as drain cleaners and paint strippers; and
- products including certain wood preservatives which might have chemical incompatibility.

285. Products that might create an additional explosion hazard include:

- products such as fertilisers containing oxidising agents;
- products containing peroxides such as certain fibreglass hardeners.

286. Aerosols and bottled gas canisters can have devastating effects if involved in a fire.

#### *ISO containers*

287. ISO containers (or similar metal storage units) used for pyrotechnic storage must, wherever possible, be kept in an area away from public access. It is recommended that measures are taken to prevent smoking in the immediate area of the container.

288. ISO containers should be marked with an orange diamond.

289. Where it is necessary to use an area of a car park, it is essential to take measures to prevent arson or some other malicious attack. The ISO or similar container must either be under constant supervision or other physical measures must be taken to prevent unauthorised access to the area around the container. Cars and other vehicles must not be permitted to park within three metres of the container. Where the container is kept in a goods delivery yard it is important to put it in a suitable place in order to reduce the risk of it being hit by vehicles.

#### *Movement*

290. All movements of fireworks around the site must be properly supervised in order to ensure that

- the fireworks are never left unattended;

- fireworks are not left, however briefly, in places where they could be inadvertently mixed up with other goods - especially flammable products;
- boxes containing fireworks are not inadvertently handled by staff (or members of the public) unaware of their contents.

291. Ideally fireworks should be taken direct from the store to the shop floor. However there may be cases where it is necessary to keep fireworks temporarily in a holding area specified for that purpose:

- the quantity in movement at any one time should be kept to the minimum necessary;
- the stock replenishment should be timed to avoid the fireworks being in movement for an unnecessarily long period of time;
- the holding area must be away from other goods;
- the fireworks must not be left unattended.

292. It is recommended that fireworks in holding areas are kept in metal-caged trolleys.

*Storage and display of pyrotechnic items on the shop sales area*

293. When pyrotechnic articles are kept in places where members of the public are present there is both an increased risk that an accident could take place, and, if there were an accident, a larger number of people could be at risk.

- These risks need to be controlled by storing and displaying the articles in a way that limits the risks of an accidental ignition and in taking precautions to protect people (both members of the public and employees) in the event of a fire.

*Preventing accidental ignition*

294. Pyrotechnic articles on the shop floor must be kept:

- in a designated area well away from sources of ignition (for example naked flames, lit cigarettes and portable gas heaters); and
- in a display case or storage cupboard or cabinet.

('Well away' means sufficiently far enough to remove the risk of ignition. This distance will depend on the nature of the heat source, and whether there are any barriers between the articles and the potential source of ignition).

295. Smoking must not be allowed anywhere where pyrotechnic articles are stored or sold ('No smoking' notices should be displayed).

296. Display cases and storage cabinets must be designed to protect against sparks or other sources of ignition and to prevent handling of unpackaged items by members of the public or by members of staff who are not specifically engaged in activities related to the sale of the fireworks.

297. It is preferable to use appropriately labelled inert or non-explosive samples of fireworks for display. It is important to avoid mixing live articles and dummies. Where live samples are used for display purposes they must be kept in a suitable display case. When live samples are removed from a display case, they must be kept under the supervision of a member of staff until sold.

298. It is also preferable that the display case is not used for the display or storage of other articles (except any instruction leaflets/safety literature) so that the case is only opened when the pyrotechnics are sold. In any event they must not be kept in the same display case as flammable substances, chemicals, or articles such as lifejackets with self-inflating gas cylinders.

299. It is essential to ensure that the cabinets and display cases do not present a spark or heat hazard to their contents. Lights or other electrical fittings may only be used if dummy pyrotechnic articles are being displayed. If such cabinets are to be used to store or display live articles then they must be disconnected from the electrical supply and measures taken (such as warning notices) to prevent the apparatus from being inadvertently reconnected.

300. It is also essential to ensure that cabinets and display cases are dry before use to avoid the pyrotechnic articles becoming damp. They must be thoroughly cleaned after use to ensure no loose composition is left behind.

301. Appropriate steps must be taken to prevent unauthorised access to display cases. Normally, this would mean using lockable cases that are locked when unattended.

**Information box: It is important to note that there may also be additional requirements under firearms legislation for the storage and display of small arms ammunition. The police will be concerned to ensure that appropriate precautions are taken to prevent these articles falling into the wrong hands.**

### *Controlling the quantity in the sales area*

302. It is essential to control the levels of stock held in the sales area. The guiding principle is to control the extent of the hazard to which people would be exposed in the event of a fire by avoiding storing unnecessary quantities of explosive on the shop floor. However, in considering how much stock to keep in the sales area it will also be necessary to avoid excessive transport movements through the shop, taking into account the anticipated trading levels for the day.

303. In any event, the amount kept on the shop floor must not exceed the levels set out in Table 1. It is important to stress that these figures are maximum quantities. Where significant quantities of highly flammable liquids or other highly flammable articles are likely to be present, then the amount that is to be stored will need to be reduced to take into account the additional fire loading from these substances. Again, the advice of the competent person carrying out the risk assessment under the Fire Safety Regulations should be followed as to what reduction will need to be made - this will in turn depend on factors such as whether the premises have an automated sprinkler systems etc. It is also important to remember that the licence (or registration certificate) quantity limit applies to the amount held on the premises, including the amount held on the shop floor.

304. The licensing authority may issue a licence to permit a a greater amount to be kept than that specified in the table [refer to the regulation that does this]. Where the licensing authority is not the fire service they may need to consult the fire service. Regulation 13 (7) provides for the licensing authority to insert additional licence requirements in such cases. These licence conditions may cover:

- the amount of fireworks that can be kept in the area to which the public has access;
- the location of the sales/storage areas in relation to escape routes and the storage of flammable substances (if any);
- escape routes;
- fire safety measures such as the provision of smoke detectors or restrictions on the presence of flammable substances;
- other safety precautions.

305. The general principle behind the table is to take into account the size of the sales area where the

pyrotechnics are present and from which the public will need to escape. Where the premises are divided into a number of sales areas (whether rooms or otherwise enclosed areas) the size of the room or area where the pyrotechnics are sold must be used in determining the maximum amount of fireworks that may be kept in the sales area (as distinct from the maximum amount that may be kept on the site).

Table 1

Total floor area of the sales area (square metres)	Maximum quantity of pyrotechnic articles that may be kept under a registration (net mass - kg)	Maximum quantity of pyrotechnic articles that may be kept under a registration (gross weight - kg)	Maximum quantity of pyrotechnic articles that may be kept under a licence (net mass - kg)	Maximum quantity of pyrotechnic articles that may be kept under a licence (gross weight - kg)
up to 20	12.5	50	20	80
up to 40	15	60	25	100
up to 60	20	80	35	140
up to 80	25	100	50	200
up to 100	30	120	60	240
up to 150	35	140	70	280
up to 200	40	160	80	320
up to 250	45	180	90	360
up to 300	50	200	100	400
up to 350	55	220	110	440
up to 400	60	240	120	480
up to 450	65	260	130	520
up to 500	70	280	140	560
500 and over	75	300	150	600

306. It must be stressed that the amount that can be kept in any given location will depend on the circumstances, and on the ability to comply with the requirements of the Regulations. For example, in considering where to locate the display/storage area it is essential to ensure that the items are located so that employees and members of the public can easily evacuate the area in the event of a fire.

307. The responsibility for controlling the amount of pyrotechnics on the premises also extends to designing sales systems that avoid the need for customers to carry quantities of pyrotechnic articles around the shop and enable/encourage customers to make (or collect) their purchases immediately before leaving the shop. This aim might, for example, be achieved by operating a system where customers can order their purchases and pick them up on their way out or by selling pyrotechnic articles from a separate sale point located near to, but not impeding, the exit.

*Slowing the spread of fire in the sales area*

308. As well as controlling the overall total of fireworks kept on the shop floor it is also essential to reduce the hazard by taking steps to slow the spread of fire both within the stock and from the pyrotechnic articles to other flammable substances.

309. In order to slow the spread of fire, the pyrotechnic articles must be divided between storage cabinets, or display cases, each holding no more than 12.5 kg net mass (50 kg gross).

310. The storage cupboards or cabinets may be of wood or metal or another substantial material that does not readily catch fire.

*Protecting people in the event of a fire*

311. The key measures to be taken to protect people in the event of a fire are:

- ensuring that they are able to escape quickly from the area and from the shop;
- controlling the quantity of explosives present on the shop floor;
- breaking that quantity down into smaller units (so that if there is a fire this does not immediately involve the whole stock) and taking steps to slow the spread of fire between the units;

- taking steps to ensuring that, if the pyrotechnics catch fire, the fire does not easily spread to other flammable substances on the shop floor.

The more detailed requirements under each of these headings are set out in the following paragraphs.

*Helping people escape*

312. The provision of fire escapes and other precautions is covered by fire safety legislation. Anyone storing pyrotechnic articles must ensure that they comply with the relevant requirements of that legislation and in particular ensure that the explosives are not stored or placed anywhere where they would endanger people escaping from a fire, or impede their exit routes.

313. In the event of a fire it is important to tell the fire service (and other emergency service personnel attending) that pyrotechnic articles are present and where they are being stored.

*Storage adjoining or in the same building as residential premises*

314. If more than 75 kg net of Hazard Type 4 pyrotechnic articles are kept in a store within, or adjoining, a building containing residential accommodation, suitable steps must be taken to protect residents of those premises in the event of a fire. The following specific precautions must be taken:

- a fire detection system must be installed;
- the residential parts of the building must have access/exit routes that are separate to those used for the pyrotechnic store;
- there must be suitable fire separation between the pyrotechnic store and the residential accommodation is required (for example, doors and floors/ceilings offering 30 minutes fire resistance);
- the store must be closed off and secured from the residential part of the property in order to both prevent unauthorised access (including by children connected with the residential accommodation) and also to help prevent the accidental introduction of sources of ignition.

Where these precautions cannot be taken the licensing authority may decide that the premises are not a suitable place for the storage of explosives and refuse a licence.

Information box: Hazard Type 4 pyrotechnic articles include items such as consumer fireworks, flares, smoke signals, cable cutters, explosive rivets, toy caps, party

poppers and cracker snaps in bulk for Christmas crackers. While strictly not pyrotechnic articles, some other Hazard Type 4 explosives, such as small arms ammunition and nailgun cartridges, may be treated in a similar way when kept in shops and other premises.

315. [look again at this. Please see the guidance to Regulation 5 [para references for guidance on the storage of black powder, detonators and similar items in or near domestic premises]. This guidance should also be followed for Hazard type 1 fireworks.]

## **Information box**

### ***Age restrictions on sale of explosive articles***

It should be borne in mind that age restrictions apply to the sale of explosives. Staff should be made aware of these legal requirements. At the time of writing the Fireworks (Safety) Regulations 1997 prohibit the supply of fireworks to anyone apparently under the age of eighteen and Section 31 of the Explosives Act 1875 (as amended by the Explosives (Age of Purchase etc) Act 1976 prohibits the other explosives to anyone apparently under the age of 16. [needs updating]

## **ACOP**

316. The explosive content in items such as party poppers, toy caps and Christmas crackers is so small that, in the quantities in which they are normally likely to be found on retail premises, they present minimal risk. These articles may be kept on open display in their retail packaging.

317. However, it is important to remember that although the quantity of explosive in each item is small, very large quantities may altogether contain a significant quantity of explosive and must be treated with the same care as other explosive articles.

### ***Car air bags and seat belt pre-tensioners***

318. The major hazard from car air bags is their accidental inflation in a working area; an unrestrained car air bag may become a potentially lethal projectile. Airbags should preferably be kept in a cupboard or store room (or building) away from working areas, and away from electrical power sources, flammable materials and other dangerous goods. It is essential to leave sufficient space so that there is room for a bag to inflate. The storage of airbags in filing cabinets and similar cupboards or drawers is strongly discouraged because, if



the bag accidentally expands, this could create an additional hazard from fragments of metal.

319. Where there is no suitably sized storage room or cupboard then airbags may be kept in a wire cage, again away from flammable and other hazardous materials. The cage must be sturdy enough to contain an accidentally inflated airbag.

### Storage of other explosives

320. The general principles for the storage of explosives reflect the broad principles outlined in the rest of this publication. Safety measures are required to reduce the risk of an explosion being initiated and to limit the consequences in the event of initiation. The safety measures which follow from these general principles are:

- separating the most sensitive substances or articles (particularly detonators) from less sensitive explosives, so that in the event of an accidental initiation they do not act as an initiator for the larger quantity of less sensitive material. For example, detonators must be kept in a separate compartment from blasting explosives;
- keeping explosives, other than those which are still in the course of being processed, within their transport packaging, wherever possible, and only removing them in an appropriate and suitable place away from the storage area;
- keeping separately explosive substances or articles which present a special risk or hazard.

321. It is important to ensure that the following are kept separately from other explosives:

- explosives presenting a special risk (eg due to water activation or presence of hypergolic liquids, phosphides or a pyrophoric substance). Explosive substances or articles in this category will be assigned to Compatibility Group L under the **Classification and Labelling of Explosives Regulations 1983 (CLER)**; Reference needs updating
- especially hazardous explosives and articles. These include articles containing both an explosive substance and either white phosphorus (Compatibility Group H); a flammable liquid or gel (Compatibility Group J); or a toxic chemical agent (Compatibility Group K);
- 'normal' product explosives from those believed to be suspect due to deterioration, or other reasons. Samples, or other materials made as part of research

and development, should not be stored with normal products;

- classified from non-classified explosives; and
- waste explosives from non-waste explosives.

Information box: further information about Compatibility Groups is available from HSE guidance *HSG 162 The Carriage of Dangerous Goods Explained Part 4* and also from the Explosives Hazard Data Sheet.

322. The explosives should be kept well away from materials such as flammable liquids, other flammable substances, LPG and gas cylinders, pesticides and packaging materials (unless the explosives are in the process of being packed). It is also important that explosives are not kept in such a way that self-confinement increases the hazard (unless they are incorporated into the explosive device).

#### *Stock management*

323. Appropriate arrangements should also be made for stock management. These include:

- ensuring that the oldest stock of explosives is easily accessible and is used first and in any event, within its recommended shelf life. If it is intended to extend storage beyond the recommended shelf life, tests should first be conducted to ensure that it is safe to do so;
- recording all movements of explosives in and out of the store so there is always an up-to-date record of the amount and type of explosive in the store. Recording is an important measure to help ensure that licence limits are not breached. It is good practice to keep duplicate records in a safe place outside the store. It should be noted that the Control of Explosives Regulations contain requirements on the making, preparation and production of records for those people keeping certain explosives (but not fireworks);
- stacking explosives boxes, packages or other containers in a stable manner, laid flat and with the top side up;
- avoiding over-stacking as this can result in pressure deformation of packaging, the spilling and exposure of the contents, and the possible deterioration of the explosive; and
- leaving a sufficient gap between stacks and walls to allow air to circulate freely.

#### *Activity in storage area*

324. It is essential that activity in storage buildings and areas is kept to a minimum. Activities such as fusing, or removing fuses, must not under any circumstances be carried out in storage buildings or areas where explosives are stored. The same applies to any maintenance activities which might give rise to a source of ignition (eg flame, mechanical spark, inductive spark).

325. There may be some circumstances (eg checking the condition of stocks of explosive, or certain maintenance tasks) where it may be less risky to carry out the activities within the store - to avoid creating additional risk by moving explosives out of, and then back into, the store. If it is necessary to carry out activities in a store, these must be carefully planned, controlled and supervised, and based on a suitable and sufficient risk assessment (this may well involve the use of a permit-to-work system).

326.

Replace with alternative words? - shared buildings?

## Guidance

### *Information box: Security*

It should be noted that the Control of Explosives Regulations contain specific requirements on the security of certain explosives.

## Storage of ammonium nitrate and ammonium nitrate blasting intermediates etc

Signposting box: This section covers the storage of:

- ammonium nitrate, ammonium nitrate blasting intermediates and other raw materials used in the production of ammonium nitrate-based explosives;
- ammonium nitrate emulsion explosives;
- ammonium nitrate and fuel oil mixtures (ANFO).

Information box: Additional guidance on the storage of ammonium nitrate is given in the HSE guidance INDG 230L *Storing and handling ammonium nitrate*.

## ACOP

### *Risk assessment*

327. Any risk assessment should take into account the potential for the spread of fires from neighbouring properties especially adjoining buildings.

### *Location, design and construction of storage buildings*

328. Ammonium nitrate and ammonium nitrate blasting intermediates must be stored separately from:

- explosives stores and from explosives manufacturing and blasting operations.
- other fuels such as flammable liquids, oils, greases, powdered metals, and other chemicals which are incompatible with ammonium nitrate or emulsions such as acids, chlorates, zinc, copper and copper salts; and
- aluminium powder (see paragraphs 359 to 360 for further guidance on the storage of aluminium powder).

329. Unless there is a fire-resisting barrier between them, a fire-break separation distance of 10 m should be maintained between the ammonium nitrate stores or ammonium nitrate blasting intermediate storage tanks and other buildings or stocks of flammable materials on or off the site.

330. Table 2 [below] shows separation distances to be maintained between stores holding explosives and stores of ammonium nitrate and/or ammonium nitrate blasting agents. Please note that the table does not apply where the stores only hold ammonium nitrate or blasting intermediates - in these instances only the fire-break distance of 10 m would apply. Where the explosive is kept in a mounded store then the 'barricaded' distances apply. The barricaded distances also apply where there is a natural or artificial barricade around the ammonium nitrate or between it and the explosive. Site operators should seek further advice from HSE on the suitability of natural barricades.

*Table 2: Separation distances between explosives stores and ammonium nitrate/blasting intermediates*

1	2	3	4	5	6
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Quantity of explosive (kgs)	Distance (in metres) to be maintained between the store and ammonium nitrate passing detonation resistance test or AN blasting intermediate in UN 3375 ( <i>barricaded</i> )	Distance (in metres) to be maintained between the store and ammonium nitrate passing the detonation resistance test or AN blasting intermediate in UN 3375 ( <i>no barricade</i> )	Distance (in metres) to be maintained where the AN has not passed the detonation resistance test or where the AN blasting intermediate is not in UN 3375 ( <i>barricaded</i> )	Distance (in metres) to be maintained where the AN has not passed the detonation resistance test or where the AN blasting intermediate is not in UN 3375 ( <i>no barricade</i> )	Minimum thickness of artificial barricade (cm)
Under 50	1	5	3	20	30
50 -100	1	7	4	23	30
100 - 200	1	8	5	29	30
200 - 500	2	11	7	41	30
500 - 1000	2	15	9	55	30
1000 - 2000	3	19	11	68	40
2000 - 3000	4	21	13	75	40
3000 - 4000	4	23	14	82	50
4000 - 5000	4	25	15	89	50
5000 - 6000	4	26	16	94	50
6000 - 7000	5	27	16	98	60
7000 - 8000	5	28	17	102	60
8000 - 9000	5	29	18	105	60
9000 -10000	5	31	19	111	60
10000 -15000	6	36	21	128	80
15000 - 20000	7	40	24	144	80
20000 - 30000	8	48	28	168	90
30000 - 40000	9	54	33	195	100
40000 - 50000	10	60	36	216	130
50000 - 60000	11	66	39	234	130
60000 - 70000	12	71	43	258	130
70000 - 80000	13	79	47	283	130
80000 - 90000	15	87	52	314	130
90000 - 100000	16	96	57	342	150
100000 - 110000	17	100	61	363	150
110000 - 120000	18	107	64	384	150
120000 - 130000	19	113	68	405	150

**331. It is essential that buildings used for the storage of ammonium nitrate are well ventilated; constructed from materials that will not burn, such as concrete, brick or**

steel; and located away from sources of heat, fire or explosion. It is recommended that access is restricted to those who need to enter the building.

332. When keeping ammonium nitrate or ammonium nitrate blasting intermediates, care must be taken to avoid drains, channels or pits where, in the event of fire, molten ammonium nitrate or ammonium nitrate blasting intermediates could become confined. Where the presence of drains etc is unavoidable they will need to be protected so that molten material cannot run into them.

333. Floors must be made of non-combustible material without hollows where molten ammonium nitrate could concentrate in the event of a fire. It is important that floors are easy to sweep and to clean with water. Care must be taken to ensure that ammonium nitrate or ammonium nitrate blasting intermediates cannot accumulate in nooks and crannies or cavities either in the store or in equipment.

334. Light fittings need to be robust, made of material which does not readily burn and constructed or positioned so that ammonium nitrate dust cannot penetrate them. It is strongly recommended that main electrical switches, fuses, etc are located outside the storage area to minimise the risk of fire. Local switches must not be located anywhere where they could lead to a fire in the store or come into contact with stored ammonium nitrate.

335. Care must be taken to ensure that ammonium nitrate blasting intermediates cannot accumulate in hollow sections in equipment such as storage tanks.

#### *Storage tanks*

336. To avoid unnecessary confinement, storage tanks must be fitted with a pressure relief device, which may be of the re-closing spring-loaded type, a frangible disc or a fusible element. The set-to-discharge or burst pressure must not be greater than 2.65 bar. The pressure-relief device must be designed to prevent the entry of foreign matter or leakage of the ammonium nitrate blasting intermediate. If portable transport tanks are used, it is recommended that these are located on a hard standing with clear access all round.

337. Fixed tanks must be securely located and fixed in accordance with the manufacturer's recommendations, such as on a frame or platform. The tanks must not be fitted with a bund but may have sloping ground to allow ejected material to flow away from the tank in the event of fire. Only inorganic non-combustible materials are to be used for any thermal insulation of the tank.

338. The design and construction of portable transport tanks must comply with the requirements of the Carriage of Dangerous Goods Regulations 2004.

*General management and housekeeping*

339. All materials used in the manufacture of ANFO or ammonium nitrate blasting intermediates must be stored in a dry location. Ammonium nitrate, fuels and other incompatible materials must be kept separately from one another. Suppliers' guidance on the storage of particular materials must be referred to and followed.

340. Fuel oil must be stored away from ammonium nitrate and ammonium nitrate blasting intermediates. If stored in the open, the distance between the ammonium nitrate store and fuel must be adequate to prevent cross-contamination. Tanks containing fuel oil should be bunded, the bund designed to contain 110% of the tank volume.

341. Precautions are also necessary to exclude sources of ignition or contamination - including in particular copper or copper alloys and zinc. The building and handling routines must be designed to prevent organic material and other foreign materials coming into contact or being mixed with the ammonium nitrate and ammonium nitrate blasting intermediates.

342. Self-confinement of ammonium nitrate in large stacks can increase the risk of detonation of the whole stack. It is good practice to limit stacks of relatively low density ammonium nitrate (ie below 900 kg/m<sup>3</sup>) to 2 m high and 3 m wide and a stack size of 300 t maximum. There should be a space of at least 1 m between stacks and between the stack and the wall, electrical equipment or heating pipes. Where water sprinkler systems have been fitted, there should be sufficient clearance above the top of the stack to allow for the operation of water sprinklers in the event of fire.

343. Where packaged ammonium nitrate is stored:

- there should be adequate space between each row of packaging to allow for inspection of the material;
- the packages should not be piled so high as to damage the packages of the lower units.

344. Decomposition can occur if heaters are positioned too near to ammonium nitrate or if dust deposits are allowed to accumulate on steam pipes or other heating devices. Direct electrical heaters (ie fan or radiant heaters) must never be used in ammonium nitrate stores.

345. It is advisable to ensure that the storage temperature for ammonium nitrate is kept below 32°C

because if the material is cycled through 32°C several times the prill structure could break down.

346. Devices (such as hot water or trace heating) used to keep the emulsions at their design temperature must be fitted with a thermal cutout to prevent overheating.

347. A suitable stock management system must be maintained to enable monitoring of stock levels and substances being held (and therefore any compatibility issues which might arise).

348. It is essential to ensure that:

- filled bags and intermediate bulk containers are stored in stable stacks;
- walls, floors and equipment are kept clean. Spillage is cleared promptly;
- organic materials such as sawdust are not used as an aid to cleaning floors;
- contaminated products are disposed of promptly and safely; and
- pallets, ropes or covers are not allowed to become impregnated with ammonium nitrate.

349. It is important to remove combustible waste materials from the store. Unused pallets should not be stored in, or against the walls of the store.

#### *Maintenance*

350. The storage area (or other working area where ammonium nitrate is handled) must be thoroughly cleaned before any maintenance that involves heat such as welding or cutting. Apart from the risk of explosion in confined areas, there is also the risk of toxic fumes being produced (see paragraph **Error! Reference source not found.** for further information on maintenance work and the operation of a "permit-to-work" system).

#### *Vehicles in ammonium nitrate stores*

351. Only battery or diesel-powered vehicles may be used in ammonium nitrate stores. Any vehicle used in a building with bulk, loose ammonium nitrate must be fitted with an effective spark arrester to its engine exhaust.

352. The vehicles need to be checked carefully for any fuel, lubricating or hydraulic oil leaks, as these can become mixed with ammonium nitrate on the floor and form substances which are potentially explosive.



353. No vehicle maintenance activities, or equipment repair activities, may take place within the storage area of ammonium nitrate.

354. Care is also needed to avoid garaging any vehicle in an ammonium nitrate store. Normally a firewall offering half-hour fire resistance should separate ammonium nitrate storage facilities and vehicles.

355. Where it is necessary for a vehicle to enter a building containing ammonium nitrate (for example for loading) precautions must be taken to prevent contamination from grit, oil etc.

356. Mobile equipment must be fitted with a suitable fire extinguisher for fighting any fire on the vehicle. Such equipment must not be left running while unattended in the storage area.

#### *Solidified product*

357. A risk assessment should be carried out before any work is carried out on the caked ammonium nitrate and specialist advice should be obtained from the supplier. Explosives must never be used to break down solidified product, as there is considerable risk that the ammonium nitrate will detonate.

358. Specialist advice from the supplier must be obtained if ANFO or ammonium nitrate blasting intermediates have solidified.

#### *Storage of aluminium powders and other materials*

359. General guidance on the storage of aluminium powder is contained in HSE booklet "Safe handling of combustible dusts" (HSG 103) and specific advice on the storage arrangements should be obtained from the supplier. Many of the grades of aluminium powder used in the manufacture of explosives are extremely fine and the presence of aluminium dust in the air can lead to explosions. It is important to take care to avoid the creation of dusty atmospheres.

360. Aluminium powder containers must be kept in clean, dry storage buildings separate from ammonium nitrate storage. It is important that the store is kept scrupulously clean to prevent dust accumulating on ledges, window sills etc which might be disturbed and cause a dust cloud explosion. It should be noted that under certain circumstances these powders can react violently with water. Even minor water ingress can lead to dangerous levels of hydrogen being produced which may explode and release aluminium dust.

#### *Security*

361. [Need to review in relation to NaCTO guidance?]

Reasonable steps need to be taken to prevent unauthorised access to the ammonium nitrate and the tanks containing ammonium nitrate blasting intermediates. It is recognised that it would not be reasonably practicable to prevent an organised and pre-planned attack; the aim of these measures is to deter entry by children and vandals or arsonists.

## Mixing of emulsion explosive and ANFO

### *Specification of suitable mixtures*

362. The ammonium nitrate prills need to be sufficiently porous to absorb all of the fuel oil which is added. In addition, the prills need to be capable of holding the fuel oil without appreciable liquid separation, during its time in the borehole.

363. In the production of ANFO, it is important to add sufficient fuel to the ammonium nitrate prills in order to achieve a mixture which is close to oxygen balance. For fuel oil, ie diesel or gas oil, oxygen balance is achieved by the addition of 5.0-7.0% (by weight) of oil, depending on the elemental composition of the fuel oil. Deviation from oxygen balance will lead to the production of excessive toxic post-detonation fumes, poor blast performance with the increasing likelihood of unstable quarry or rock faces and overhangs, and even misfires.

364. The quality of the oil used for ANFO manufacturing may not be critical, provided the flash point is significantly higher than the process or ambient temperature. It is recommended that the flash point is greater than 45°C.

### *ANFO mixing process*

365. It is important to ensure that any process chosen to mix ammonium nitrate and fuel oil to produce ANFO is capable of mixing the ingredients to the required tolerances. Not only should the correct amount of fuel oil be added to the ammonium nitrate, they must be thoroughly mixed together to produce a uniform mixture. Uneven dispersion of fuel oil will yield more toxic gases on detonation than a homogeneously mixed product. The finished ANFO product should be checked on a regular basis to verify the required tolerances of the mixing equipment. It is good practice to use a colourant in the fuel oil to give a visible check on the completeness of the mix.

366. Because of the hazards associated with post-detonation gases, ANFO for use underground needs to be manufactured to a high standard to minimise the amounts

of carbon monoxide and nitrogen oxides produced. Additional precautions are required and should include maintenance and calibration of the mixing machinery at periods identified in the risk and COSHH assessments.

#### *Training and operating procedures*

367. While ANFO and emulsion explosives are relatively insensitive to shock, impact etc, all those involved in their manufacture and use must be aware that it is still a potentially hazardous material and should therefore be handled with care.

368. There must be clear work instructions and safe systems of work. Only those who have successfully completed appropriate training in these procedures and methods should be permitted to operate equipment for manufacturing ANFO, ammonium nitrate blasting intermediates or emulsion explosives.

369. When pumping ammonium nitrate blasting intermediates only those staff involved in the operation should be allowed into the area around the pumps and bore holes.

370. Suitable protective clothing (overalls, gloves etc.) and eye protection should be provided whenever ammonium nitrate, diesel and other raw materials are being handled.

371. When mixing for immediate use, care is needed to mix no more than is required for the task in hand. Mixing must take place as close as is reasonably practicable to the point of use.

### **Guidance**

#### *Health precautions*

372. Information on the health hazards of the materials used in the manufacture of site-mixed explosives should be obtained from the suppliers and other information may be found in CHIP. Assessments under the Control of Substances Hazardous to Health Regulations 2002 should be carried out not only on the materials handled but also on the products of combustion, especially where these may be present in confined spaces.

373. Gas oil/diesel oil are irritants to the eyes and may cause dermatitis on prolonged or repeated contact. The skin may be seriously affected by prolonged exposure especially when clothing is also oil contaminated. The acute toxicity and irritant effects of aluminium powder are low, but it should be noted that chronic exposure to aluminium dust can result in fibrogenic effects on the lungs, which can be severe.

#### **Information box: Environmental issues**

The ingredients of ANFO and emulsions are harmful to aquatic life and drinking water, so care should be taken to avoid spillage into ponds, rivers or streams etc. ANFO and emulsions should never be disposed of by dissolution in water where there is a risk of the ingredients entering controlled waters and ground water.

Arrangements should be made for environmentally acceptable methods for disposal of any contaminated water (for example the waste water can be recycled).

Arrangements should be made for fire water run-off in the event of a fire involving ammonium nitrate, ammonium nitrate blasting intermediates and fuel oil.

## **Fusing fireworks**

### **Guidance**

374. 'Fusing' is the term used to describe the assembly and preparation of firework display pieces by firework display operators from single fireworks. It can also involve the attaching of a fuse to a single unfused firework or the alteration of the fuse by, for example, the addition of plastic igniter cord as a delay element to piped quickmatch. Some fireworks are supplied to the display operator without a fusing system or with an incomplete fusing system. The display operator may link several such fireworks together by fusing to make a combination with just one point of ignition, and in which the individual fireworks go off in a predetermined sequence. Fusing may take place at the site where the fireworks are to be fired immediately before the display is fired (display site), or at another place such as a firework display operator's base.

375. It is important to stress that the same precautions must be taken if fuses are removed and/or displays dismantled.

### **ACOP**

376. There are a number of precautions which need to be taken while fusing:

- fusing must take place in a building or area (which may be outside) at a safe distance (15 metres) from storage or manufacturing areas;
- no other working activity (for example the construction of the frames onto which the fireworks are attached) may take place in a building or area used for fusing while it is being used for fusing;
- the numbers of employees or other workers in the fusing area at any one time must be kept to a minimum -

generally three should be regarded as maximum. Where there is only one exit, there should be no more than two in the area at any one time;

- black powder and pyrotechnic composition exposed through cutting, baring back or dismantling must be left exposed for the minimum time, otherwise it should always be completely sealed within the casing of the firework or the outer covering of the fuse. However, it is recognised that some composition may be shed when fuses are cut;
- there must be no repair or breakdown of fireworks other than repairs to the fusing system;
- there must be no flammable or explosive materials in the area other than those necessary for the work in hand;
- the quantities of fireworks and other pyrotechnic materials (eg quickmatch, tapematch, igniter cord, igniters and fuseheads) exposed or stored in the fusing area must be restricted to the amount needed for the piece that is being worked on;
- completed firework display pieces must be put into the store as they are finished and not kept in the fusing area;
- any lighting or other electrical equipment used in the area must be suitable for use in an explosives area;
- workers involved in fusing work must be made aware of the safety precautions which have to be taken;
- fuses should only be cut in the manner advised by the manufacturer or supplier of the fuse; and
- it is strongly advised that each operation is covered by a written work instruction.

377. Appropriate measures should be taken to minimise the risks of ignition during the handling of fireworks and fuse materials. Typical precautions include:

- using sharp cutting tools made from non-sparking materials, or which cut against a non-sparking surface. The manufacturer or supplier's advice should be obtained on the best way of cutting the fusing materials and only the recommended tools used. Fuse material must not be torn apart;
- taking particular care when inserting or removing fuseheads from black match. Fuseheads can be easily ignited by friction, crushing or cutting and must be handled with care;

- taking care when joining different types of fuse to avoid bringing incompatible materials into contact for example sulphur with chlorate;
- never stapling fuses directly into place. Staple guns may only be used to attach ties or similar items which are then used to secure the fuse; and
- ensuring that all joins are made so as to leave no exposed composition. It is important that joins are strong enough to withstand the stresses they will experience and taped if necessary.

**Regulation 5 Separation distances**

5.—(1) Subject to paragraphs (2) and (3), every person who stores explosives at a site shall ensure that the relevant separation distance prescribed by Schedule 2 is maintained between a store and a building or other place not within that site to which that Schedule applies.

(2) Paragraph (1) shall not apply to explosives which are stored under a licence granted by the Executive in cases where the assent of the local authority was required pursuant to regulation 13(3).

(3) Paragraph (1) shall not apply to the storage of explosives where the total quantity of explosives stored at a site, excluding, in the case of subparagraph (b), any amount of small arms ammunition, does not exceed —

- (a) 100 grams;
- (b) 30 kilograms of shooters' powder and 100 grams of percussion caps;
- (c) 200 detonators and —
  - (i) 5 kilograms of water-based explosive and detonating cord; or
  - (ii) 5 kilograms of water-based explosive or detonating cord; or
- (d) in the case of explosives kept by a police force —
  - (i) 4 kilograms of explosive kept for the purpose of training dogs used for the detection of explosives; and
  - (ii) 30 kilograms of explosives kept for the purposes of ordnance disposal;

and the explosives are stored in a safe and suitable place with all due precautions for public safety.

(4) Every person to whom the duty under paragraph (1) applies, shall ensure that the separation distance referred to in paragraph (5) is maintained between a store and any building on the site in which the store is situated, which is used either for accommodation or for work, but not including any building used for work which is normally unoccupied by any person and is not a store.

(5) The separation distance referred to in paragraph (4) is that which is equal to half the relevant separation distance determined in accordance with Schedule 2.

(6) Every person who, in a case to which paragraph (3) of regulation 13 applies, is granted a licence to manufacture or store explosives shall ensure that the local planning authority in whose area the manufacture or storage takes place is, within 28 days of the licence being —

- (a) granted; or
- (b) varied in a way which affects the separation distances required to be maintained,

given a plan of the site and its immediate surrounding area showing the separation distances required to be maintained pursuant to the licence or varied licence.

(7) "Local planning authority" in paragraph (6), in relation to an area —

- (a) in England and Wales has the same meaning as it has in Part I of the Town and Country Planning Act 1990<sup>(a)</sup> save that, where there is more than one local planning authority, it means the district planning authority for the district;
- (b) in Scotland means the council for the local government area.

## Guidance

**378.** The tables of separation distances given in Schedule 2 apply to all stores other than:

- stores holding very small quantities of explosive ie 100 g or less;
- stores holding 30 kg of shooters powders or less and/or up to 100 g of primers for small arms ammunition, subject to certain conditions (see paragraphs 409 to 419);
- stores holding up to 200 detonators and 5 kg of water-based explosive and detonating cord; or 5 kg of water-based explosive or detonating cord, subject to certain conditions (see paragraphs 0 to 426);
- stores used by the police to keep no more than 4 kg of explosives for use in training dogs used for the detection of explosives and up to 30 kg of explosives kept for ordnance disposal;
- stores licensed by HSE where the local authority has given its assent to the grant of the licence;
- stores at sites controlled by the Ministry of Defence.

**379.** It is important to emphasise that these distances also apply to registered stores, and to stores operated by organisations which are exempt from the licensing requirements. This includes any stores operated by local authorities and police forces (except those police forces keeping small quantities of explosives for detection dog training and ordnance disposal - see paragraph 378).

**380.** Regulation 5 imposes a continuing duty on the storeholder. If there is development which means that existing separation distances cannot be maintained then the storeholder must reduce the quantity of explosives held or even, in extreme circumstances, relocate the store. In some cases the storeholder may also take other measures such as mounding or the removal of the detonator annex. The storeholder might also opt to keep explosives with a hazard type requiring smaller separation distances

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<sup>(a)</sup> 1990 c. 8; Part I was amended by the Leasehold Reform, Housing and Urban Development Act 1993 (c.28) section 187(1) and Schedule 21, paragraphs 28 and 29, the Local Government (Wales) Act 1994 (c.19) sections 18(2) to (6), 19(1) and (4) and 66(8) and Schedule 18, and the Environment Act 1995 (c.25) sections 67(1), 78 and 120(1) and (3) and Schedule 10, paragraph 32(1) and (2) and Schedule 24.

- although in most cases the nature of the business requirements mean that this is unlikely to be an option.

**381.** The existence of these requirements does not in itself prevent development near to explosives stores. It is the responsibility of the storeholder to take the necessary steps to ensure that they continue to comply with the requirements. Some operators of explosives sites have done this by securing covenants on the land around their stores or by outright purchase. Where development does take place, the storeholder would need to consider the actions needed to ensure continued compliance.

**382.** The distances apply between the explosive store and inhabited buildings. There are also distance requirements for public traffic routes, and public places.

**383.** There are no requirements to maintain separation distances between stores and uninhabited buildings. However, storeholders should bear in mind that such buildings could be reoccupied or redeveloped in the future at which point the relevant requirements would apply.

**384.** It should also be noted that certain buildings which could endanger an explosives building (eg a high-voltage electrical generating plant) will not normally be inhabited. The requirements of regulation 4 mean that storeholders will need to take account of the risks posed by such buildings in deciding where to locate their stores.

**385.** Schedule 2 uses the term 'dwelling'. In this context, 'dwelling' includes individual flats within a block of flats. The term 'occupation' is used in the definition of 'building' in Schedule 2. In this context, 'occupation' includes a workplace.

#### ***High-and low-density distances***

**386.** In certain cases, the tables in Schedule 2 also specify distances for high population density areas. These tables specify the maximum number of houses (or other dwellings such as flats) which may be in a specified area around the store before the higher distances apply. Where there is a dash in the column marked 'High density' it means that there is no high-density distance and the low-density distance applies. In these cases the tables do not specify a reference zone or a maximum number of dwellings and there is also a dash in this column.

**387.** An illustration showing how to work out whether the high or low-density distance applies is in Annex 2.



388. It is expected that the large majority of stores, and of applications for licences, will continue to be in rural areas. In most such areas it will be immediately clear that the area is low population density. Where it is necessary to make a count of the number of inhabited buildings it is suggested that the electoral register would be a suitable source of data on the number of households in residential areas.

389. It should be emphasised that there is a continuing duty on the storeholder to comply with the requirements in cases where subsequent development means that the number of dwellings in the reference zone exceeds the threshold at which the High Density distance applies.

#### **'Vulnerable buildings'**

390. The tables also include distances to be maintained from vulnerable buildings. These buildings are those of curtain-wall construction, where the method of construction means that in the event of an explosion, there would be a hazard to anyone in the area from falling glass and masonry. There are no vulnerable building distances for Hazard Type 3 or 4 explosives therefore the tables for these explosives do not include a column for 'vulnerable building distance'.

#### **Mounds**

Overview: Schedule 2 uses the terms 'mounded' and 'unmounded' buildings. It also defines 'mounded' as meaning surrounded by suitable mounds.

A mound is a barrier that will intercept fragments and debris caused by an explosion in a building or store. In the event of explosion, mounds serve two purposes:

- to protect explosives stored in nearby buildings from initiation by fragments; and
- to reduce the risks to inhabitants of nearby occupied buildings from fragments and debris.

Natural ground features may be used for this purpose, but the most common forms are artificial earth mounds, reinforced concrete walls or containers filled with earth.

#### **ACOP**

391. Mounds are ideally located approximately 1m from the building wall, unless access requires a greater distance. This will provide maximum shielding and minimise the height, which should be at least to the eaves of the building and be a minimum of 1m thick at the top.

392. If a sloping mound is used (single or double slope), the slope must be sufficient to ensure the stability of the mound material. It is useful to stabilise mounds by planting with grass or other vegetation.

393. If a filled container mound is used, it must be of sufficient height and thickness to be effective. In the case of a steel store the following examples should be taken as a starting point:

- store dimensions 0.91m x 0.76m x 0.84m high containing 75kg of HT1 explosives: a 1 metre thick mound, minimum height the height as the store; and
- store dimensions 1.68m x 1.68m x 1.52m high containing 450kg of HT1 explosives, minimum thickness 1.2m minimum height the height of the store.

[Can we say anything about a 900 or 1800 kg store?]

394. It is important to ensure that the materials used to construct mounds do not exacerbate the debris/fragment problem. Mounds should therefore be made of sand, or clay or earth. There should be no rocks or stones greater than 75 mm in diameter and the rocks should make up no more than 10% of the total weight.

#### *How to use the tables*

#### **Guidance**

395. The Tables in Schedule 2 show in Column 1 two figures in each row for the quantity of explosives (for example 25-50kg). The effect of Schedule 2 (1)(3) is that this means, in this example, more than 25 kg and no more than 50 kg (ie 25.1-50 kg but not 50.1 kg).

396. Distances are measured from the outside edge of the building or place where explosives are stored to the nearest point of the building or place to which the separation distance applies. The distance should be measured in the horizontal plane.

397. Where there is more than one store on a site the separation zone is a composite of separation distances around the individual stores.

#### **HSE licensing**

398. Paragraph 2 of regulation 5 has the effect of creating two possible routes which HSE may follow in granting licences:

- it may grant a licence to which the separation distances specified in Schedule 2 would apply. In other words it would license on the same basis as local licensing authorities. HSE would normally only licence on a 'fixed rules' basis at a mine or for the mixing of

ammonium nitrate emulsions. A licence granted following this route would not require the assent of the local authority;

- in cases where the quantity of explosives is greater than 2000kg of explosive or where HSE uses its discretion to vary the separation distance requirements the licence would be subject to the assent of the local authority.

399. When it grants licences HSE would normally follow the distances given in Annex 3. These distances are consistent with those given in Schedule 2 of the Regulations. Where a distance is not specified in the table for a specific quantity (because the quantity is very large or it lies between the points given in the table, HSE would use the appropriate formula. These are shown in Annex 4.

Redraft the next paragraph to pick up the general issue of discretion

400. It is open for applicants to apply to HSE for licences for stores holding less than 2000kg or to depart from the distances specified in these tables. However, HSE would only use its discretion to depart from the separation distances required by Schedule 2 if other risk and hazard reduction measures were taken which would ensure an equivalent level of safety. These additional measures would be included as conditions in any licence.

#### ***Plans showing separation distances***

401. Regulation 5(6) requires those granted a licence by HSE to give to the local planning authority, within 28 days, a plan of the site and its immediate surroundings, showing the separation distances required to be maintained by the licence (a safeguarding plan). A similar requirement applies where a licence is varied in such a way that separation distances are affected. In cases where separation distances extend into the area of another local planning authority, a plan should also be sent to that authority. Guidance on the preparation of a safeguarding plan is available from HSE (see also paragraph 524).

#### ***Refusal to licence an unsuitable site***

402. In exceptional cases licensing authorities may take the view that, even though these distances can be maintained, the site is still not a suitable one for an explosives store. Such circumstances may include:

- proximity to a school or nursery, sheltered accommodation or hospital;

- proximity to buildings such as football stadia or other public places used by very large numbers of people.

403. Local licensing authorities should also seek specialist advice (including HSE) where there are topographical features likely to affect the direction and distance of blast effects or fragment throw; such situations are likely to be highly exceptional and would include:

- a store located against a cliffside;
- a store on a steeply sloping hillside with housing below.

### **Hazard Type**

Overview Box: The quantity of explosive which may be kept without the need to hold a licence or to register depends on the Hazard Type. Definitions of the hazard types are given in regulation 2 but are repeated here for ease of reference, together with (in *italics*) additional explanatory information:

- *Hazard Type 1: an explosive which, as a result of, or as a result of any effect of, the conditions of its storage or process of manufacture, has a mass explosion hazard (a mass explosion is one in which the entire body of explosives explodes as one);*
- *Hazard Type 2: an explosive which, as a result of, or as a result of any effect of, the conditions of its storage or process of manufacture, has a serious projectile hazard but does not have a mass explosion hazard;*
- *Hazard Type 3: an explosive which, as a result of, or as a result of any effect of, the conditions of its storage or process of manufacture, has a fire hazard and either a minor blast hazard or a minor projection hazard, or both, but does not have a mass explosion hazard (ie those explosives which give rise to considerable radiant heat or which burn to produce a minor blast or projection hazard); and*
- *Hazard Type 4: an explosive which, as a result of, or as a result of any effect of, the conditions of its storage or process of manufacture, has a fire or slight explosion hazard, or both, with only local effect (ie those explosives which present only a low hazard in the event of ignition or initiation, where no significant blast or projection of fragments of appreciable size or range is expected).*

It should be noted that in broad terms the Hazard Types parallel the UN hazard divisions used for classification for transport purposes. However, it should be noted that classification refers to the explosives as packaged for transport. If explosives are kept other than in their classified packages, it cannot be assumed that the hazard they present remains the same. Further guidance on Hazard Type, including information on determining the hazard type rating, is given in Annex 1.

404. The Regulations use the term 'net mass'. This refers to the mass of the explosive contained in the article, ie net of packaging and casings etc. (See paragraphs 13-15 for an explanation of the use of the term 'net mass' and its relationship to other terms used in the industry).

405. For fireworks the net mass should be assumed to be one quarter of the gross weight unless the manufacturer has provided more specific information.

406. Where premises are shared, the quantity of explosives stored by each person counts towards the total of the maximum quantities for purposes of licensing and setting separation distances.

407. More than one store may be registered or licensed at the same address. However, the combined total will be used in determining whether a licence is required. The combined total will apply for the purposes of determining the separation distance unless appropriate measures are taken to prevent propagation of a fire or explosion between stores.

408. Where more than one type of explosive is kept, the limit for the most energetic explosive will apply (eg if HT1 fireworks are kept with HT4 then HT1 distances will apply).

### **Storage of shooters' powder, water-based explosives detonators and detonating cord**

#### **ACOP**

409. Regulation 5(3)(b) and (c) disapplies separation distance requirements for the keeping of small quantities of shooters' powder, water-based explosives and detonating cord. The following sections describe the conditions that must be met in order to qualify for the disapplication. These conditions apply at all premises including domestic premises.

#### ***Shooters' powder***

410. *Shooters' powder* includes both black powder and smokeless powder.

411. The powder must be kept in containers with no more than 550 grams of powder per container. The containers must be constructed in such a way that, in the event of a fire they do not provide additional containment that will increase the explosive force of any deflagration. Normally plastic/polythene or paper/cloth containers will be suitable for this purpose. Metal containers with a screw cap, or a push-in lid (ie similar to a paint tin lid) must not be used.

412. Although shooters' powders are generally not very sensitive to ignition by electrostatic discharge, homeloaders or others who decant the contents of plastic containers must take care to reduce the risk of build up of static electricity. Advice on appropriate precautions may be sought from the manufacturer.

413. The containers of powder must be kept in a box constructed of plywood with a minimum thickness of 18 mm - or material with an equal or greater fire and physical resistance. (Health and Safety Laboratory tests found that 18 mm plywood offered 15 minutes' fire resistance. 24 mm plywood offered 30 minutes' fire resistance).

414. Metal boxes, including ammunition boxes, are not suitable and must not be used. This is because, firstly while metal is fire resistant it also transmits heat very well and secondly, because the metal container adds additional containment that significantly increases the explosive power of the powder. It should be noted that the requirements in this paragraph replace guidance permitting the keeping of black powder in a lacquered or tinned iron or steel trunk or box contained in the publication *A guide to the Control of Explosives Regulations 1991* (HSE ISBN 0 11 885670 7).

415. Where the box holds more than one container, each individual container must be separated by a 6 mm wooden partition that is securely fixed to the outer walls of the box. Each compartment must allow 30% additional height between the top of the container and the inside of the lid.

416. It is a good idea to put an intumescent strip around the edges of the lid to give a good seal.

417. Figure 1 shows a box that would meet the requirements set out in the previous paragraphs.



*Figure 1: Storage of shooters' powder: note intumescent strip on box lid*

418. It is important to remember anyone storing shooters powders must take due precautions to prevent unauthorised access to the powders. Where the room storing the explosives is not secured with a suitable lock and alarm system, the police will require that the box should meet certain minimum requirements. These are as follows:

- securely fixed, robust steel hinges; and
- a secure hasp used with a security-grade padlock.

Anyone requiring more information about security requirements should contact their Police Explosives Liaison Officer.

419. The box should be constructed so that there is no exposed metal on the inside. Internal nuts must be covered by a glued wooden liner not less than 6 mm. The box must not be kept in any form of metal box, drawer or cupboard.

420. The box must not be located:

- under or near any means of access or escape, for example under stairs;
- in the same room as flammable liquids;
- in areas where there are risks of fire

### *Storage of water-based explosives*

Regulation 5(c) allows the storage of small quantities of water and ammonium nitrate-based explosives assigned to UN No 0241 without the need to maintain separation distances providing certain conditions are met. The conditions are that:

- the store must be designed and constructed to ensure that there is no additional containment in the event of an explosion - for example by fitting an outward opening door that would be capable of releasing in the event of an explosion;
- the store must be constructed of fire-retardant materials such as *thermalite* block;
- it must be located inside a building (such as a garage or outhouse) but not inside a dwelling. Storage inside an integral garage is permitted, provided the precautions covered elsewhere in this section are taken;
- it must be located at floor level on a concrete (or similar) floor;
- flammables (eg petrol, LPG, paint and white spirit) must not be kept in the same room. Where the store is located in a garage, any vehicles must be removed. All wood, plastic and paper must also be removed.

421. Again it must be noted that the storage arrangements must meet security requirements of the Control of Explosives Regulations. It is assumed that the store described below will be located in a secure building. For example, this is likely to involve the fitting of a suitable monitored alarm in the premises, with a contact breaker and vibration detectors suitable for use with the explosives fitted to the store itself.

### *Detonators and detonating cord*

422. Regulation 5 (c) also provides applies to the keeping of small quantities of detonating cord. In order to qualify for the exclusion, the following conditions must be met.

423. Detonators must be kept in a separate compartment and either:

- be kept in their original UN Hazard division 1.4B or 1.4S inner and outer packaging (detonators that meet this standard will be marked UN 0256, UN 0361, UN 0456 and UN 0500);
- or kept in a manner that meets the same standard.



424. The second alternative will involve using packaging that provides a physical barrier that stops the detonation of any one detonator spreading to the rest of the case. The two principal media currently approved for use in transport are blocks of Medium Density Fibreboard (MDF) or flame-suppressed PVC. The individual detonators are placed in holes in the block. The dimensions of these holes and their spacing will depend on the detonators that are being stored. Where there is evidence that the block has been approved by a competent authority for use in the transport of that type of detonator, then it will normally be acceptable for use in storage. Where the block is constructed for use in storage then the depth of the holes must be sufficient to cover the explosive charge: generally they will be at least 27mm deep. The holes must be at least 20mm apart.

425. Detonating cord must not be kept in bulk reels - unless the manufacturer has manufactured the reels to meet the requirements of UN Hazard Division 1.4 (normally this involves using Kevlar rope to separate the detonating cord from itself as it winds onto the reel). Instead it must be cut into lengths of up to 5 metres and loosely coiled. The individual coils must be kept separated by a physical barrier that prevents the detonation of one length of cord from spreading to adjoining lengths of cord. It is suggested that these separators are made of materials such as 4 mm plywood or plasterboard.

426. Care should be taken in cutting the cord and any waste material must be carefully disposed of. The ends of the cord must be carefully taped to prevent loss of composition. It is important that the cord is coiled in such a way to avoid it cracking or splitting. The diameter of the coil will depend on the thickness of the detonating cord.

## **Regulation 6 Disposal of explosives and decontamination of explosive-contaminated items**

6.(1) Any person who disposes of explosives shall ensure, so far as is reasonably practicable, that they are disposed of safely.

(2) Any person who decontaminates explosive-contaminated items shall ensure, so far as is reasonably practicable, that they are decontaminated safely.

### **ACOP**

#### **Disposal of explosives**

427. Explosives must be disposed of safely and not as general waste. Waste explosives may only be disposed of in a designated disposal area with facilities appropriate to the type and quantity of explosives to be destroyed. A safe system of work must be in place, and suitable training must be provided for the people involved in disposal of explosives.

428. Anyone disposing of explosives should be aware that they have duties to do so in a way that is not harmful to the environment. If in doubt, further information and advice may be obtained from the Environment Agency (England and Wales) or the Scottish Environment Protection Agency.

429. There are four ways to dispose of or destroy explosives:

- burning;
- detonation;
- dissolution or dilution; and
- chemical destruction.

Sea dumping and burial are no longer, on environmental grounds, considered to be suitable methods of disposal.

430. A risk assessment is required to decide the most suitable method of disposal. The assessment needs to consider the nature of the explosive and its hazards, the disposal method and hazards created during the disposal process, and the type and position of the disposal site.

#### *Burning*

431. When burning explosives, the risk of burning to detonation must be taken into account, and measures taken to minimise the risk and to protect against the effects of a detonation should it occur. The general rule is to only burn small quantities at any one time while avoiding excessive transport movements. Items which might be propelled from the fire when burned must be suitably contained without confining the explosive.

432. Incompatible explosives must not be burned together. If there is any doubt about compatibility of explosives they must be burned separately.

#### *Detonation*

433. While disposal by detonation is relatively simple, it is essential to use a suitable site large enough to contain the effects of detonation. This method is most appropriate in 'use' situations, for example at quarries or other sites where blasting is performed. After detonation, the site needs to be checked for unconsumed explosives. Clear procedures are essential for checking whether all explosives have been fired, and all staff involved in this work must clearly understand the steps to take in the event of misfires.

#### *Dissolution or dilution*

434. Some explosives can be destroyed or desensitised by a compatible solvent or diluent. The resulting waste can then be disposed of by burning. Most powdery pyrotechnic compositions which contain a water-soluble component can be destroyed by immersion in water. The resulting liquor must then be filtered and the solids sent for burning.

#### *Desensitisation and chemical destruction*

435. Chemical destruction is normally only relevant to the decontamination of plant or spillages where 'on the spot' destruction of small amounts of explosives is required. It may also be appropriate to use this method for very sensitive explosives which may be too dangerous to transport for disposal in other ways.

436. Any secondary waste from chemical destruction must be assumed to be an explosion risk, and be dealt with accordingly.

#### *Disposal of explosive articles*

437. The method of disposal for explosive articles will depend on the nature of the particular device. The hazards and risks arising from each method need to be considered before deciding on the appropriate one to use.

438. Disposal can sometimes be safely achieved simply by exploding the article under controlled conditions at a suitable location. Alternatively, destruction of small articles may be possible in an armoured furnace. Disassembly or breakdown of articles should only be considered as a last resort. It should also be borne in mind that disassembly is an act of manufacture and must be carried out in a place licensed for manufacture. An exception to this is ordnance disposal for public safety

under the direction of a police officer or a member of HM forces.

Information box: More detailed guidance on the safe disposal of explosives and explosives contaminated materials can be found in the HSE publication *Disposal of explosives waste (Guidance Note GN CS23)*.

### Decontamination of explosive plant and equipment

439. Decontamination methods will depend on the type of explosives (or explosives articles) and the nature of the buildings, plant or equipment involved. It is essential to carry out a sufficient risk assessment before commencing decontamination work.

440. Particular care should be taken when dismantling contaminated plant. Undue force should not be used. If remote disassembly is not possible, workers should be supplied with appropriate clothing and equipment to protect them from localised detonation.

441. Even if the equipment is visually clean it must not be assumed that it is free from explosives until it has undergone some form of proving. It should be assumed that an explosion may occur at every stage of the proving process and the operation conducted accordingly. 'Hand flaming' must never be attempted.

Information box: Further guidance on decontamination is contained in the CBI Explosives Industry Group publication *Management guidance for the safe decommissioning of explosives sites ISBN 085201 598 4*.

### *Vacating an explosives site*

#### **Guidance**

442. Anyone storing or manufacturing explosives has a duty under Section 3 of the Health and Safety at Work Act to ensure so far as is reasonably practicable that their activities do not create risks for others. This applies to risks which might arise from the presence of explosives at the site after it has been vacated. All explosives buildings and sites must be thoroughly cleared of explosives before they are vacated. Depending on the, nature, use and size of the site it may be necessary to seek the advice of a specialist contractor (see also paragraphs 439 to **Error! Reference source not found.** on decontamination of explosive plant and equipment).

#### **Regulation 7 Employment of young persons**

7. No person who manufactures or stores explosives shall permit a person under the age of 18 years to work in that manufacture or storage except under appropriate supervision.

#### **Guidance**

**443.** The Management of Health and Safety at Work Regulations 1999 (MHSWR) place specific duties on employers to ensure that young people are "protected at work from any risks to their health or safety which are a consequence of their lack of experience, or absence of awareness of existing or potential risks or the fact that young persons have not yet fully matured".

**444.** The employer is required to carry out a risk assessment before a young person starts work. The assessment should consider the particular risks which may arise from lack of experience or insufficient attention to safety.

**445.** In general the presumption should be not to employ young people in roles where they are directly involved in the manufacture or storage of explosives or frequently go into explosives buildings or areas unless there are good reasons for doing so.

**446.** Young people should at all times be under appropriate supervision by a competent responsible person whenever they are in an explosives area. The level of supervision will depend on the maturity of the individual, their experience and training, the hazards they are dealing with and other procedures in place. For example, direct supervision at all times would be appropriate for a 16-year-old with little or no training or experience. A trained and experienced near-18-year-old may not require constant direct supervision, although arrangements must be in place to ensure they receive the appropriate level of direct and indirect supervision and a supervisor is on hand at all times in the event of a problem.

**447.** As with any other workers, young people handling explosives will need to have appropriate training on the risks to which they are exposed, the safety requirements, and the rules and procedures to be followed.

**448.** Supervisors of young people must be over 18. It is essential that the supervisor should have a full understanding of the hazards likely to be encountered; the safety precautions to be taken; potential problems that might occur and the action to be taken should a problem arise. In selecting and training supervisors, employers must ensure that they have the necessary experience and understanding of the risks as well as the requisite personal qualities.

**449.** These principles apply to all young people in the workplace, including those on work experience or other temporary placement schemes.

## **Regulation 8 Unauthorised access**

**8.**—(1) No person shall —

- (a) without the permission of the occupier, enter —
  - (i) any store in or at a site;
  - (ii) any building used for the manufacture of explosives in or at a site, or
  - (iii) any site with clearly marked boundaries at which explosives are stored or manufactured,  
operating under a licence or registration; or
- (b) having so entered, refuse to leave that site when asked to do so by any constable or the occupier, his employee or agent.

(2) Where the place referred to in paragraph (1) is, or is part of, a workplace, the occupier, his employee or agent may remove any person who enters without permission contrary to paragraph (1).

(3) “Enter” for the purposes of this regulation, includes entering onto a roof of a store or a building in which explosives are manufactured.

### **Guidance**

**450.** Regulation 8 prohibits anyone from entering an explosives building or area without permission from the licensee or their representative. The regulation requires anyone who has entered without permission to leave when requested to do so and permits the occupier, his or her employee or agent to remove them. It is strongly recommended that the police should be called if the person refuses to move. Normally, the occupier, their employees or agents, should only remove unauthorised people themselves in situations where they consider that there is an imminent threat to the safety of the explosives. In these circumstances it is important to emphasise that only reasonable means may be used - these will depend on the severity and imminence of the threat to the explosives.

**451.** The provisions of this regulation rely on the operator making the necessary arrangements to mark the boundaries. Larger sites are already likely to have perimeter fencing and patrolling etc. However, at small sites, particularly quarries, there may not be a secure perimeter fence and the security arrangements will be primarily a security store with a monitored alarm. In such situations it may be preferable not to draw attention to the existence of an explosives store.

**452.** The decision on whether to erect boundary markers and warning signs will need to take into account the circumstances of the store, especially its location. Where the store is in an area that is regularly used by members of the public (for example an area popular with walkers) there may be advantages in erecting signs. Where the store is in an isolated area that is unlikely to be visited by members of the public then there may be little

advantage in erecting signs. The police Explosives Liaison Officer will be happy to advise.

453. The regulation does not apply to enforcement officials in the course of their duties.

## **LICENSING AND REGISTRATION REQUIREMENTS**

### **An overview of the explosives licensing system**

#### **When a licence or registration is required**

##### ***Manufacturing***

454. A licence is required for most manufacturing activities.

455. Manufacturing includes processes where explosive articles or explosive substances are made or assembled, or unmade or disassembled. The term also includes the repair or modification of explosive articles and the reprocessing, modification or adaptation of explosive substances. The guidance to regulation 9 gives advice on what activities are considered *not* to be manufacturing.

456. Regulation 9(2) sets out which manufacturing activities do not require a licence. The main examples are:

- fusing firework displays;
- preparing theatrical television and cinematic special effects; and
- on-site mixing of explosives (either those made using ammonium nitrate emulsions, or by mixing ammonium nitrate with fuel oil).

##### ***Storage***

457. Unless only a small quantity of explosives is involved, those storing explosives will need to either register or get a licence from the local licensing authority.

458. Regulation 10 sets out the amounts of explosive that can be kept without a licence or registration. The amount will depend on the amount and type of explosives. For example there are allowances for storage of shooters' powders and for certain lower-risk pyrotechnic articles which include consumer fireworks and articles such as flares, fog signals, car airbags and seatbelt pretensioners.

459. Regulation 11 sets out the limits that can be kept in a registered store. Again, this will depend on the amount and *hazard type*. Guidance on hazard types is given

in paragraphs 0-**Error! Reference source not found.** and in Annex 1.

**460.** It is important to note that the amounts specified in regulation 11 are the net mass (weight) of the explosives ie the amount of explosive contained in the article not including any packaging or casings. In the case of fireworks, small arms ammunition and similar pyrotechnic articles, the mass of the explosive will be only a fraction of the total mass of the item. If the manufacturer has provided specific information (for example on the box or on the item itself) on the weight of the explosive content then this should be used as the amount. If they have not, or if the net amount is unclear, then the registered person/licensee should assume that the explosive content is one quarter of the total weight of the item.

**[Status of following section - guidance? Needs amending in view of ESC and EIG comments?]**

#### *Site-sharing and sub-letting*

461. It is important to note that the duties in Regulation 9 and 10 fall on the person who is manufacturing and/or storing the explosive. The licensee is accountable for compliance with the terms of the licence; it is therefore essential that the person who holds the licence has effective control over the activities covered by the licence. Equally a person carrying out these activities would be in breach of these regulations if they did not hold a licence - even if someone else held a licence at covering these activities at that site.

462. It is expected that in most situations the licensee would be manufacturing and/or storing on its own behalf, would be the sole occupier of the site, and would have complete control of the activities taking place there covered by the licence. There are however situations where this may not apply and where further guidance is necessary. These are:

- manufacture and/or storage on behalf of third-parties;
- sub-letting
- subsidiaries operating on the same site as the parent company.

#### *Manufacture/storage on behalf of third parties*

463. Anyone manufacturing and/or storing explosives would normally need to hold a licence even if they are undertaking the activities on behalf of a third party.



464. Conversely an individual or firm that contracted for a third-party to store on its behalf would not normally require a licence.

465. However, the question of which person is carrying out the activity and holds the duty under the licence would depend on who had effective control of the operation ie who determines in practice what is stored and how it is stored. For example:

- Firm A is contracted to store explosive on behalf of Firm B - Firm B delivers the explosive to the store but from then on Firm B takes over responsibility - Firm B would require the licence;
- Firm B is contracted to operate an explosives store on behalf of Firm A. Firm B has full control over the operation of the store - Firm B would require the licence;
- Firm B is contracted to operate a store on behalf of Firm A but decisions on what is stored and how are still taken by Firm A. In these circumstances Firm A is still storing while Firm B is providing labour to assist it in doing so.

#### *Sub-letting*

466. Similar principles would apply where a firm sub-lets a building or part of a site licensed to another firm. If Firm B operates the store or part of the site under its own control and independently from Firm A then it would require a separate licence. However, if Firm A continues to retain ultimate control then it would continue to be the licensee. For example:

- Firm B contracts to rent storage space from Firm A. Firm B's staff load and unload stock from and into the store, but under the supervision of Firm A then Firm A would be licensee.

#### *Subsidiaries*

467. Similar principles would also apply where a subsidiary operates on the same site as a parent company. If the subsidiary operates independently of the parent company (at least in so far as control of the licensed activities are concerned) then the subsidiary would be taken to be the dutyholder and need to hold the licence. On the other hand if the parent company continued to exercise day-to-day control then the parent company would need to hold the licence.

#### *Contractual and management arrangements*

468. It is therefore essential that firms and individuals entering into arrangements for manufacture or storage consider their respective roles and responsibilities and ensure that these are clearly understood and clearly set out in any agreements.

469. The person holding the explosives licence must maintain effective management arrangements that ensure compliance with the conditions of the explosives licence.

470. Where one or more firms share a location (site, facility or building), these arrangements must ensure that the licence holder:

- formally communicates the explosives licence conditions to the person(s) sharing the location; and
- effectively monitors compliance with the explosives licence conditions.

471. Firms undertaking an activity in a location, where the explosives licence is held by an other person, must ensure that:

- adequate management arrangements are made to ensure compliance with the conditions of the explosives licence; and
- co-operate and co-ordinate their activities in such a way as to ensure that the licence holder can monitor compliance with the explosives licence.

472. Firms sharing a location must ensure that there are adequate arrangements for ensuring co-ordination and co-operation between them (Management of Health and Safety at Work Regulations 1998 Regulation 11).

#### *Keeping explosives in more than one place*

473. The regulations do not require a licence or registration for the storage of small quantities of HT4 explosives. The allowance applies to each storage place. An organisation could therefore store small quantities at a number of locations. For example, a train company keeping small quantities of fog signals in separate places would not require any registration or licence, provided the amount kept in any one place did not exceed 5 kg net mass of explosives. A registration or licence would be required for any store holding more than 5 kg of fog signals. Similar principles apply to companies holding items such as seatbelt pretensioners, car airbags or nailgun cartridges.

#### *Where to apply*

474. This will depend on whether:

- the activity is manufacturing or simply storing;
- an explosives certificate from the police is needed to acquire and keep the explosives;

and on the quantity of explosives.

**475.** The following table sets out who is the licensing authority depending on the type and quantity of explosive.

**Table 3**

**Licensing authorities**

<b>Activity</b>	<b>Licensing authority</b>
1. All manufacture of explosives	HSE
2. Storage of more than 2000 kg of explosives	HSE
3. Storage of explosives at mines	HSE
4. Storage in harbour areas	HSE
5. Storage of up to 2000 kg of explosives if some of the explosives require an explosive certificate (eg blasting explosives or black powder)	Police
6. Storage of up to 2000 kg of other explosives (including fireworks and small arms ammunition), none of which requires an explosive certificate.	Local licensing authority (see Table 4)

**Table 4**  
**Local licensing authorities**

Location of store	Licensing authority
England	<p><b>Explosives requiring an explosive certificate:</b>  police  <b>Other explosives (eg fireworks):</b>  County Council or unitary authority where there is no County Council  Fire and Rescue Authority  London Borough  City of London</p>
Scotland and Wales	<p>Explosives requiring an explosive certificate:  police  Other explosives (eg fireworks): local council</p>

**476.** In some areas where a district council or city council has taken over the functions of the county council the authority may have agreed with the police or Combined Fire Authority for the latter to exercise enforcement and the administration of licensing on its behalf.

***How to make an application***

**477.** The first step is to contact the licensing authority. An application form is available from the HSE website.

**478.** The amount of information needed for the application will depend on the type of registration or licence. For most licences the licensing authority will need to know:

- the name of the applicant;
- intended nature of the business;
- where it is intended to keep the explosives;
- the type(s) and quantities of explosives to be kept;
- the separation distances to be maintained around the site; and
- details of any relevant planning applications affecting the site.

In addition, applicants for HSE licences will need to provide further information, including more details about the activities and processes to be carried out, the location and construction of buildings on site, and the separation distances to be maintained (for further information see paragraphs 519-520 and 524)

479. More extensive information will be required for applications to HSE for a licence for manufacturing or a larger store, where the licence will be subject to local authority assent.

#### ***Fees for applications***

480. A fee will be payable before the licensing authority will consider an application. Information on current fee levels can be found on the HSE website.

#### ***The process for considering licence applications***

481. If the application is for a licence, the licensing authority will normally wish to visit the proposed store. The licensing authority may also wish to visit the storage place if the application is for a registration.

482. In most cases where HSE is the licensing authority the applicant must ask the local authority for its assent before HSE can grant the licence.

#### ***Can a local authority refuse an application?***

483. An application can be refused, but normally only in exceptional circumstances. There are two circumstances when a licensing authority might refuse a licence:

- if it believes that the site of the proposed store is unsuitable on safety grounds. An obvious example would be someone wanting to store fireworks at a petrol station;
- if it has evidence that leads it to take the view that the applicant is not a fit person to store explosives. This would normally only be the case if the licensing authority had evidence of persistent or flagrant breaches of the safety requirements or other relevant legal requirements.

#### ***Right of appeal***

484. There is a right of appeal to the Secretary of State for Work and Pensions.

#### ***Licence/registration document***

485. The licensing authority will issue a certificate which will in most cases set out:

- the name and address of the licensee/registered person;
- the address of the store;
- the amount and type of explosive that may be kept there.

486. HSE licences may include more detailed information on, for example:

- the layout of the site;
- construction of the buildings;
- the use of the buildings (some buildings may be used for storage only, and some for manufacturing only).

***Length of a licence or registration***

487. Most registrations and licences will last for up to five years - although only a reduced fee is payable by applicants who wish to apply for a licence or registration that lasts for a shorter period. The exceptions to this are:

- licences from HSE for manufacturing or larger stores - these normally continue indefinitely; and
- where the applicant already holds a firearms or explosives certificate, the licensing authority may set a renewal date so that the licence or registration comes up for renewal at the same time as the firearms or explosives certificate.

***Revocation of registrations/licences***

488. A registration or licence can be revoked, but only in exceptional circumstances. If the advice given in this document is followed the need for revocation should not arise.

***Other legal requirements that apply***

489. It is important to stress that the duties concerning prevention of fires and explosions still apply even where there is no requirement to obtain a licence (or to register with the local authority). There may also be duties under the Control of Explosives Regulations to ensure that explosives are kept securely.

***Changes to a licence or registration after it has been granted***

490. A licence or registration can be changed by agreement between the registered person/licensee and the licensing authority to take account of a change of circumstances. A fee is payable to cover the licensing authority's costs.

491. In exceptional circumstances the licensing authority may change the licence or registration without the agreement of the registered person/licensee. This will normally only be if there is a change in circumstances that means the amount that can be kept at the store must be reduced.

## **Regulation 9 Explosives not to be manufactured without a licence**

9.—(1) Subject to paragraph (2), no person shall manufacture explosives unless he holds a licence for that manufacture and complies with the conditions of that licence.

(2) Paragraph (1) shall not apply to —

- (a) the manufacture of explosives for the purpose of laboratory analysis, testing, demonstration or experimentation (but not for practical use or sale) where the total quantity of explosives being manufactured at any time does not exceed 100 grams, but nothing in this subparagraph shall be taken as authorising any acquisition or keeping of explosives for which an explosives certificate, within the meaning of regulation 4 of the Control of Explosives Regulations 1991<sup>(a)</sup>, is required by virtue of regulation 7 of those Regulations, without such a certificate;
- (b) the making or unmaking of small arms ammunition or the preparation of cartridges for use with firearms which are to be used at historical re-enactment events, where the total quantity of primer and propellant used at any one time does not exceed 2 kilograms and, for these purposes, the quantity of propellant used includes propellant removed from cartridges;
- (c) the preparation of shot firing charges in connection with their use;
- (d) the preparation, assembly, disassembly and fusing of firework displays at the place of intended use;
- (e) the preparation, assembly and fusing, in quantities of no more than 10 kilograms at a time, by a person registered or licensed to store explosives, at the site which contains his store, of firework displays to be used by him;
- (f) the preparation, assembly and fusing of explosives commissioned for use in theatrical, television or cinematic special effects;
- (g) the reprocessing of an explosive to form a pharmaceutical product which is not in itself an explosive;
- (h) the mixing for immediate use of —
  - (i) ammonium nitrate with fuel oil; or
  - (ii) ammonium nitrate blasting intermediate with another substance, at a mine or quarry, to produce an explosive which is not cap-sensitive; or
- (i) the use of desensitised explosives in the manufacture of products which are not in themselves explosives.

(3) In paragraph (2)(h), “cap-sensitive” means an explosive which gives a positive result when tested in accordance with the Series 5(a) test of the Manual of Tests and Criteria, third edition<sup>(b)</sup> supporting the United Nations Recommendations.

## **Guidance**

### **Manufacture**

#### ***What is manufacture?***

492. Regulation 9 requires those who manufacture explosives to hold a licence. A definition of ‘manufacture’ is given in regulation 2. This includes processes where explosive substances or explosive articles are made or assembled, or unmade or disassembled (eg manufacture of gunpowder, filling of fireworks,

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<sup>(a)</sup> S.I.1991/1531, amended by S.I.1993/2714.

<sup>(b)</sup> ISBN 92 - 1 - 1390680.

breaking down of jet perforating guns, removing fuses from artillery shells).

***...and what isn't***

**493.** There are a number of processes that are not considered to be 'manufacture' for the purposes of this regulation. These include:

- packing or repacking explosives or explosive articles;
- breaking down explosives stored in bulk into smaller storage containers;
- labelling explosives or explosive articles;
- testing and proofing explosives or explosives articles;
- using explosives articles as components to make a product which is not classified as an explosive (for example, the preparation of an explosive actuator into a fire drencher system, or fitting air bags to vehicles).

***Manufacturing activities that do not require a licence***

**494.** The regulation specifies a number of processes where the requirement to hold a licence to manufacture does not apply. However, although such activities are not subject to the licensing requirements, they are nevertheless still subject to the other requirements of these regulations. These are discussed in more detail in the following paragraphs.

***Fusing firework displays***

**495.** A manufacturing licence is not required for the preparation, assembly and fusing of firework displays, ie:

- removing individual fireworks from their transport boxes, packaging or other containers;
- connecting individual fireworks together and/or attaching them to frames or other structures for display;
- linking individual firework fuses together; and
- attaching a main fuse to ignite the assembled display.

**496.** It should be noted that the disapplication does not apply to the manufacture of individual fireworks used in the display.

***On-site mixing***

**497.** A manufacturing licence is not required for the mixing of ammonium nitrate and fuel-oil mixtures at a mine or quarry. These processes are considered to be part of the blasting operations and therefore subject to the



requirement to produce shotfiring rules and a blasting specification. All of the issues that would be addressed in the licence will be covered in these documents.

**498.** If ammonium nitrate blasting intermediates were to be manufactured at the site, a licence from HSE would be required.

**499.** A licence will be required for on-site mixing at sites which are not subject to the Quarries Regulations (ie civil engineering works).

### **Other exclusions**

**500.** Two other exclusions from the requirement to hold a licence for manufacturing activities are:

- reprocessing an explosive substance to produce a product which is not classified as an explosive (for example the preparation of nitro-glycerine-based pharmaceutical products);
- using desensitised explosive in processes, including laboratory analysis, that do not produce a product that is itself an explosive.

### **Regulation 10                      Explosives not to be stored without a licence**

**10.—**(1) Subject to paragraph (2), no person shall store explosives unless he holds a licence for their storage and complies with the conditions of that licence.

(2) Paragraph (1) shall not apply to —

- (a) the storage of explosives by a person registered in accordance with regulation 11;
- (b) the storage of one or more of the following —
  - (i) no more than 10 kilograms of black powder;
  - (ii) no more than 5 kilograms of —
    - (aa) shooters' powder;
    - (bb) any explosive or combination of explosives listed in Schedule 1 to the Control of Explosives Regulations 1991; or
    - (cc) a combination of shooters' powder and any one or more of the explosives listed in Schedule 1 to those Regulations;
  - (iii) no more than 15 kilograms of percussion caps or small arms ammunition or a mixture of them;
- (c) the storage of no more than 7 kilograms of —
  - (i) hazard type 1 or 2 explosives, or
  - (ii) a combination of hazard type 1 or 2 explosives with explosives of another hazard type,for no longer than 24 hours;
- (d) the storage of hazard type 3 or 4 explosives for no longer than 24 hours;
- (e) the storage of no more than 100 kilograms of —
  - (i) hazard type 3 explosives, or
  - (ii) a combination of hazard type 3 and 4 explosives,

provided that the explosives are stored for no longer than 3 days in their place of intended use;

- (f) the storage of —
    - (i) no more than 250 kilograms of hazard type 4 explosives provided that the explosives are stored for no more than 3 days in their place of intended use; or
    - (ii) no more than 50 kilograms of hazard type 4 explosives consisting solely of fireworks provided that the fireworks are stored for no longer than 21 days and are not for sale or for use at work;
  - (g) the storage of desensitised explosives which have been allocated in accordance with the United Nations Recommendations the U.N. nos. 2059, 2555, 2556, 2557, 1336 or 1337.
- (3) For the purposes of paragraph (2) —
- (a) no more than one of the exceptions listed in subparagraphs (a) to (f) of paragraph (2) shall apply to explosives stored at the same site at the same time, irrespective of the person who is storing them; and
  - (b) the quantities referred to in that paragraph are the maximum quantities of the explosives or explosive articles they respectively relate to which may be present at a site at any one time.

## **Guidance**

**501.** Guidance to regulations 10 and 11 is contained in paragraphs 502 to 510.

### **Regulation 11 Registration in relation to storage**

**11.—(1)** Subject to paragraph (5), a person who wishes to store within one site at any one time no more than —

- (a) 30 kilograms of explosives of any hazard type;
- (b) 100 kilograms of hazard type 3 explosives;
- (c) 100 kilograms of a combination of hazard type 3 explosives with explosives of hazard type 4;
- (d) 250 kilograms of hazard type 4 explosives; or
- (e) 250 kilograms of small arms ammunition and percussion caps and 30 kilograms of shooters' powder;

may apply to the licensing authority in whose area the storage will take place to be registered in respect of that storage.

(2) The licensing authority shall register the applicant unless any of the grounds for refusing to do so referred to in regulation 15 apply.

(3) Where a licensing authority registers an applicant, it shall issue the applicant with a certificate of registration, in a form approved for the time being for the purposes of this regulation by the Executive.

(4) A registration shall remain in force for such period not exceeding five years as the licensing authority determines.

(5) For the purposes of paragraph (1) no more than one of the exceptions listed in subparagraphs (a) to (e) of paragraph (1) shall apply to explosives stored at the same site at the same time, irrespective of the person who is storing them.

(6) Where the registration relates to the storage at a site of pyrotechnic articles which are to be offered for sale at that site, the amount of those pyrotechnic articles which may be kept for any period of time in a sales area at that site shall be restricted to the amount determined in accordance with Schedule 3 and for these purposes and those of Schedule 3, "sales area" means an area where pyrotechnic articles are sold and to which any person who is not an employee of the person who is registered in respect of the storage of those pyrotechnic articles has access.

(7) No application for registration may be made in respect of the storage of explosives at a site at which the manufacture of explosives also takes place or is to take place.

(8) The quantities referred to in paragraph (1) are the maximum quantities of the explosives or explosive articles they respectively relate to which may be present at a registered site at any one time.

## Guidance

**502.** Explosives may not be stored without a licence, except in the circumstances described in regulation 10(2) or if the store is registered under regulation 11.

## Exemptions from the requirement to hold a licence

**503.** It should be noted that the exemptions from the requirement to licence specified in regulation 10(2) (a) to (f) are alternatives and are not cumulative. However, the effect of 10(2) (b) is cumulative, ie it permits the keeping of up to 15 kg of black powder and other shooters' powder, of which no more than 5 kg shall be shooters' powder (other than black powder) and/or Hazard Type 4 explosives listed in Schedule 1 to the Control of Explosives Regulations. In addition, 15 kg of percussion caps or small arms ammunition may be kept under this allowance (Table 5 illustrates what may be kept without a licence or registration under regulation 10(2) (b)).

Table 5

Hazard Type or Description (Regulation)	What can be kept without a licence or registration (kg net mass)	Duration of storage
Black powder (Reg 10(2) (b) (i))	Up to 10kg	Indefinite
Any Hazard Type 4 explosive listed in Schedule 1 to the Control of Explosives Regulations 1991 and/or any type of shooters powders (Reg 10(2) (b) (ii))	5 kg in total	Indefinite
Percussion caps and small arms ammunition (Reg 10(2) (b) (iii))	15 kg	Indefinite
Hazard Type 1 or 2 (Reg 10(2)©(i)) or a combination of Hazard Type 1 or 2 explosives with explosives of another Hazard Type (Reg 10(2)©(ii))	7 kg	Up to 24 hours
Hazard Type 3 or 4 (Reg 10(2) (d))	Unlimited	Up to 24 hours
Hazard Type 3 or a combination of Hazard types 3 and 4 (Reg 10(2) (e) (i) and (ii))	100 kg	Up to 3 days in their place of intended use

Hazard Type 4  or	250 kg	Up to 3 days in their place of intended use
Fireworks of Hazard Type 4 (Reg 10(2)(f))	50 kg	Up to 21 days and not for sale or for use at work

Note: an allowance may be claimed under only one heading

**Temporary storage**

The Regulations permit the keeping of certain quantities of explosive for short periods of time without the need for a licence or to register with the local authority. Typical circumstances in which this might apply include the site of a firework display or re-enactment event or temporary storage.

**504.** For the time being section 23 of the Explosives Act 1875 still applies and requires occupiers of licensed and registered sites to take all due precautions to prevent unauthorised access. This means the temporary storage of high explosives other than black powder must be either in a suitable store with a monitored alarm or under appropriate supervision.

**505.** The following are examples of appropriate supervision:

- the driver, attendant or other responsible person is in constant attendance;
- the processes for which the explosives are required are continuing around the clock, the place of work is continually manned and access to it is controlled; and
- the explosives are kept in a vehicle in a compound. Access to the compound must be controlled (eg securely fenced) and regularly patrolled or monitored by closed circuit TV.

It is planned to incorporate this requirement from section 23 of the Explosives Act into amendments to the Control of Explosives Regulations 1991.

**506.** It is important to note that the maximum quantities that may be kept at registered premises or under the licence are the maximum quantities that may be present at that site at any one time. This includes explosives that are only temporarily present at the site - for example explosives that are being transhipped from one vehicle to another.

**507.** It is also important to note that regulations 10(2)d and 10(2)e only allow explosives to be kept at the site for the specified period of time. All explosives must be

removed from the site before the end of that period. If any explosives are left then the person storing those explosives will be in breach of the duty - this applies even if the particular items have been present at the site for less than the specified period.

508. Please see also paragraphs for guidance on the [defence provisions].

**More than one store at one site**

509. It is possible to locate more than one store at the same address. However, the combined total of the explosives to be kept will be used in determining whether a licence or registration is required. The combined total will apply for the purposes of determining the separation distance unless appropriate measures are taken to prevent propagation of a fire or explosion between stores.

**More than one type of explosive at a store**

510. Where more than one type of explosive is to be kept at a store the quantities at which a licence is required (and in certain cases, the licensing authority) will reflect the most hazardous type kept at the store. For example if HT 4 is kept with HT 3 then the licence requirements for the aggregate quantity will be the same as they would be for the same quantity of HT3.

**Regulation 12 Applications for licences and registration**

12. An application for a licence or registration shall be made to the licensing authority on a form approved for the time being for the purposes of this regulation by the Executive.

**Guidance**

511. An application for a licence should be made to the relevant licensing authority. The relevant authority will depend on the type of licence for which application is being made and the location of the proposed site.

512. HSE licenses:

- all manufacture of explosives;
- storage of more than 2000 kg of explosives; and
- storage of explosives in mines and harbour areas.

513. The police license the storage of up to 2000 kg of explosives if some or all of the explosives require an explosives certificate.

514. Local licensing authorities license the storage of up to 2000 kg of other explosives (including fireworks and small arms ammunition) which do not require an explosives certificate

515. For further guidance on licensing authorities see paragraph 474.

516. It is important to note that under these regulations there are two possible routes for HSE to grant licences. The first is where the licence is subject to local authority assent. This route would be taken for all manufacturing activities and for all storage of more than 2000 kg of explosives. HSE has discretion in setting separation distances and regulation 5(1) does not apply. This route may also be used in exceptional cases where the applicant wishes to propose alternative safety measures in return for a lower separation distance. Again this would be subject to local authority assent. The second route applies only to the licensing of the storage of less than 2000 kg of explosives at a mine, or to the storage of ammonium nitrate emulsion. In these cases HSE may license using the distances set out in Schedule 2. Where it does so, it does not need to seek local authority assent. If it wishes to vary these distances then it will need to go to the local authority for assent.

517. The storage of explosives in harbour areas is licensed by HSE under the Dangerous Substances in Harbour Areas Regulations 1987.

### **Application process**

518. The application process will depend on whether the granting of the licence is subject to local authority assent. The guidance to regulation 14 gives advice to those applying to HSE for a licence that is subject to local authority assent (see paragraphs 524 to 534).

### ***Applications for licences from local licensing authorities***

519. Applications for licences for smaller stores - ie those keeping no more than 2000 kg of explosives - should be submitted to the relevant local licensing authority (applications for stores keeping more than 2000 kg of explosives should be made to HSE). The application should include details of [following will need to be checked once application form is agreed]:

- name of applicant;
- address and map reference of intended place of keeping. If the intended place of keeping is an existing building, with a street number and postcode, this information should be included. If it does not, or if there is any uncertainty about the postcode or the map reference, then the intended location should

be marked on a large-scale map such as an Ordnance Survey Site Plan, or other similar scale map;

- nature of the intended business (eg firework display, quarrying, wholesale/retail supply of fireworks, theatrical or film special effects, blasting services);
- the type and maximum quantity of explosive to be stored; and
- the separation zone to be maintained around the store; and
- relevant planning applications.

**520.** It is suggested that, although it is primarily the responsibility of the applicant to advise the planning authority of any application, as a matter of good practice where the local licensing authority is not the planning authority, it should consult the planning authority for the area.

### **Regulation 13                      Grant of licences**

**13.—(1)** A licence may be granted for such period not exceeding five years as the licensing authority determines, save that in a case to which paragraph (3) applies, a licence may be granted for any period or without a time limit.

(2) Subject to paragraph (3), the licensing authority shall grant a licence unless any of the grounds for refusing to do so referred to in regulation 15 apply.

(3) Subject to paragraph (4), where the Executive is the licensing authority, the procedure set out in regulation 14 for obtaining the assent of —

- (a) the local authority, or
- (b) each local authority where the proposed site which is the subject of the application for a licence is situated partly within the area of one local authority and partly within the area of another,

shall apply and the Executive shall refuse to grant a licence unless the local authority, or each local authority, as the case may be, has so assented.

(4) Paragraph (3) shall not apply —

- (a) where the Executive is the licensing authority in a case where the application is for a licence to store at a mine or within a harbour explosives of no more than 2000 kilograms to which paragraph (a) of the definition of “explosive” in regulation 2(1) applies;
- (b) to an application for a licence relating to the manufacture of explosives by means of on-site mixing;
- (c) to an application for a licence relating to the manufacture of ammonium nitrate blasting intermediate; or
- (d) to an application for a licence relating to the manufacture or storage of explosives —
  - (i) by a person who wishes to carry on such manufacture or storage within a part of a site where another person already holds a licence for the manufacture or storage of explosives; and
  - (ii) the application relates to manufacturing or storage activities which would be permitted at that part of the site under the existing licence; and

- (iii) in the opinion of the Executive or a local authority whose assent is required, no significant safety issues are raised by the application beyond any which arose in relation to the application for the existing licence.

(5) Every licence shall specify —

- (a) the site and, within it, the places where the explosives may be manufactured or stored;
- (b) the hazard type and maximum amount of explosive which may be manufactured or stored, as the case may be, at any one time at or in any place so specified; and
- (c) the maximum amount of explosive that may be present at the site at any one time .

(6) In addition to the matters specified in paragraph (5), a licence which is granted by the Executive in cases where the assent of the local authority was required pursuant to paragraph (3)—

- (a) shall be granted subject to such conditions as the Executive considers appropriate which relate to separation distances;
- (b) may be granted subject to such conditions as the Executive considers appropriate which relate to —
  - (i) the construction, siting or orientation of any building (including any protective works around the building) where the activity will be carried on; and
  - (ii) the activities which may be undertaken in specified buildings,

and in this sub-paragraph —

“activity” means the manufacture or storage of explosives and it includes any handling, on-site transport, testing and disposal of explosives and “activities” shall be construed accordingly; and

“construction” means the materials used in, and the design of, a building; and

- (c) may, where both the manufacture and storage of explosives at the same site was applied for, cover both that manufacture and storage for the purposes of, respectively, regulations 9 and 10.

(7) In addition to the matters specified in paragraphs (5) and (6), where a licensing authority grants a licence which relates to the storage of pyrotechnic articles at any site where those articles are to be offered for sale, the licensing authority may attach such conditions to the licence as it considers appropriate which relate to —

- (a) the storage and display of those articles in areas where they can be purchased;
- (b) the prevention of risk of fire arising in respect of those articles; and
- (c) the safe use of fire escapes in that area.

(8) A licence granted pursuant to this regulation shall be in a form approved for the time being for the purposes of this regulation by the Executive.

(9) For the purposes of paragraph (4), “on-site mixing” means the mixing at any place of non-explosive substances or preparations to form an explosive for immediate use at that place.

## **Guidance**

**521.** It is important to note that the licence is granted to a person (which may include a company, or other legal entity) to permit certain activities (ie manufacture and/or storage) at a specified place - or places. A change of storage place within the licensed site will therefore require a licence variation (under Regulation 16) rather than a fresh licence.

**522.** HSE licences will normally be granted without a time limit. However, regulation 13 provides for a licence to be granted for a specified time where the applicant does



not wish to undertake manufacture and/or storage at that site on a permanent basis. (Regulation 16 in turn provides for the licence to be extended or made permanent - subject to local authority assent).

**523.** If an application is rejected, or if the applicant disagrees with any of the proposed licence conditions, the applicant has a right of appeal under section 44 of the Health and Safety at Work etc Act 1974 (see also guidance in paragraph 556).

#### **Regulation 14                      Local authority assent**

**14.—(1)** Where this regulation applies by virtue of regulation 13(3), the Executive shall, subject to regulations 15 and 18, issue the applicant with a draft licence containing the conditions, if any, which the Executive proposes to attach to the licence.

(2) The applicant shall as soon as reasonably practicable send a copy of the application and draft licence to the local authority in whose area the manufacture or storage is proposed to take place.

(3) Within 28 days of sending to the local authority the information specified in paragraph (2), the applicant shall —

(a) cause to be published in a newspaper circulating in the locality where the manufacture or storage of explosives is proposed to take place a notice which shall —

(i) give details of the application;

(ii) invite representations on matters affecting the health and safety of persons other than the applicant's employees to be made in writing to the local authority within 28 days of the date that the notice is first published; and

(iii) give an address within the area of the local authority at which a copy of the application and draft licence may be inspected and the addresses of the local authority to which any representations must be sent; and

(b) take other reasonable steps to give that information to every person who resides or carries on a business or other undertaking within the public consultation zone.

(4) The local authority shall send a copy of any representations referred to in paragraph (3)(a)(ii) to the applicant as soon as reasonably practicable after receiving them.

(5) In considering whether to assent, the local authority shall have regard only to health and safety matters.

(6) Subject to paragraph (7), the local authority shall, before deciding whether to assent to the application, hold a public hearing within 4 months of the date of its receipt of the copy of the application and draft licence referred to in paragraph (2).

(7) If, after the period of 28 days referred to in paragraph (3)(a)(ii) has elapsed, the local authority has received no objection to the application, or has only received objections which in its opinion are frivolous or immaterial, it may assent to the application without holding a hearing.

(8) Not less than 28 days before the hearing referred to in paragraph (6), the local authority shall publish notice of the date, time and place fixed for the hearing in a newspaper circulating in the locality and shall send a copy of the notice to —

(a) the applicant;

(b) any person who made representations referred to in paragraph (3)(a)(ii); and

(c) the Executive,

within 7 days from its publication.

(9) The local authority shall notify the applicant and the Executive of its decision within 7 days of making it.

(10) Where the local authority fails to —

- (a) send a copy of the notice referred to in paragraph (8) to the Executive within 3 months from the date that a copy of the application and draft licence was sent to it pursuant to paragraph (2); or
- (b) fails to notify the Executive of its decision in accordance with paragraph (9), within 2 months from the date of publication of the notice referred to in paragraph (8),

the Executive may make a written request to the local authority for it to state in writing whether it assents to the application.

(11) Where the local authority does not respond to the written request within 28 days from the date of the request, the local authority shall be deemed to have assented to the application.

(12) The applicant shall pay a fee to the local authority for the performance by that authority of their functions under this regulation, which fee shall not exceed the sum of the costs reasonably incurred by that authority in performing those functions.

(13) In this regulation, “applicant” means the applicant for a licence or variation of a licence and “application” means his application.

## **Guidance**

### ***The application process where the licence is subject to local authority assent***

**524.** HSE produces detailed guidance to assist applicants for licences granted by HSE that are subject to the assent process set out in this regulation. The guidance, and application forms may be obtained from:

HSE Explosives Inspectorate  
Merton Road  
Bootle  
Merseyside L20 7HS  
Tel: 0151 951 4000  
e-mail:

[explosives.licensing@hse.gsi.gov.uk](mailto:explosives.licensing@hse.gsi.gov.uk)

**525.** An outline of the application procedure is set out below. The first step is for the applicant to provide HSE with information on:

- the intended activities and processes;
- the activities to be carried out in each explosive building or area on site;
- the quantity and types of explosive involved;
- the separation distances to be maintained around the site;
- the location and construction of buildings (including ISO containers) and their intended use;
- the location of any areas used for activities such as fusing or the burning of waste explosives;
- the separation distances to be maintained around the site; and

- the separation distances to be maintained within the site between storage and production buildings for the protection of workers on site and the prevention of propagation of fire.

526. HSE may reject the application as unsuitable for that site. Such a decision would be based on the particular circumstances of the site for example:

- bulk storage of flammable substances at or in the immediate area of a site such that there would be a substantial risk that a fire or explosion at the store would cause a fire in the flammables, or a fire involving the flammables could spread to an explosive building;
- the presence of hazardous substances at or in the immediate area of the site such that there is a significant risk that an explosion at the site would cause the release of hazardous substances into the wider area;
- proximity of telecommunications transmitters where there is a significant risk that the electromagnetic energy from the transmitters could initiate an explosion in the explosives (see paragraphs **Error! Reference source not found.-Error! Reference source not found.** for sources of information about transmitters);
- the presence of methane at the site or at an adjoining site (for example from a landfill site) such that there is a significant risk that a fire or explosion involving methane could spread to the explosives; and
- the presence at, or in the immediate area of the site, of gas pipelines or high-voltage electricity supply such that there would be a significant risk that an explosion involving the explosives would result in significant 'knock-on' consequences.

Should the application be rejected the applicant would have a right of appeal (see paragraph 539).

527. HSE may also return the application to the applicant for further consideration and/or development.

528. If HSE takes the view that, on the basis of the information available to it, the outline proposals are satisfactory, it sends details of the outline proposals to the relevant local authority. The relevant authority for the area is:

- in Scotland and Wales: the local council (sometimes also known by the term "unitary authority");

- in England:
  - the county council;
  - the London borough;
  - a fire and civil defence authority where there is one; or
  - the unitary authority where it has taken over the functions of the county council in its area.

***The purpose of the local authority assent process***

**529.** The purpose of the local authority assent process is for the local authority to satisfy itself that any local factors bearing on the safety of the operation of the site or the health and safety of members of the public have been considered and taken into account by HSE in setting the licence conditions. Only evidence on these issues should be regarded as relevant to the authority's decision. Issues concerning the appropriateness of development at the site should be considered as part of the planning process.

**530.** The local authority will be asked to consider whether there are any local factors which could affect the safety of the operations or the safety of those in the area in the event of a fire or explosion. Such factors would include:

- bulk storage of flammable substances at or in the immediate area of the site;
- the presence of hazardous substances at or in the immediate area of the site;
- the proximity of telecommunications transmitters;
- the presence of methane at the site or at an adjoining site;
- the presence at, or in the immediate area of the site, of gas pipelines or high-voltage electricity supply lines or equipment; and
- transport access (although where the application involves a parallel application for planning consent the authority may also wish to address such issues through planning controls).

**531.** In addition, the local authority may withhold its assent if it believes that the site is not suitable for the manufacture or storage of explosives due to the presence of vulnerable sections of population (young children, the sick or elderly) in the immediate area of the site, for example, if a building housing a school,

hospital or old people's home were immediately adjoining an explosives site. This judgement is one that is more appropriate to the local authority than to HSE.

**532.** As a matter of good practice it is suggested that, where the local authority is not the planning authority, it should consult the planning authority for the area. Similarly, it may also wish to consult the fire service or combined fire authority if there is one. Applicants are also advised that, where they are making a parallel application for planning consent in relation to the site, they should draw this to the attention of the relevant local authority officials, and to the relevant local planning authorities where these are different.

**533.** It must be stressed that HSE's enquiries of the local authority are for the purposes of identifying and resolving any concerns which otherwise would need to be addressed later in the process. They do not in any way reduce the duty on the applicant to identify any hazards arising from the proposed undertaking, and identify those people who might be affected and how they might be affected. The applicant must carry out any necessary 'due diligence' enquiries for this purpose.

**534.** Assuming that the information provided by the local authority indicates that the application can be taken to the next stage, HSE will agree a draft licence with the applicant, taking into account any considerations drawn to its attention by the local authority. Once agreement on the draft licence has been reached it will be formally submitted by the applicant to the local authority in order to seek assent.

***Publishing notices and informing local residents***

**535.** Regulation 14(3)(a) requires the applicant to publish a notice in a newspaper circulated locally to inform interested parties of the application, stating where details about the application and draft licence may be obtained, and providing information for those who wish to make representations to the local authority.

**536.** Regulation 14(3)(b) requires the applicant to take 'reasonable steps' to inform anyone living in, or carrying out an undertaking within, an area extending to double the proposed separation distance of the proposed site (the 'public consultation zone'). In addition, the applicant should take reasonable steps to inform owners of property within, or adjoining, the separation zone. Reasonable steps would include writing to, or leafleting, those affected.

***If the local authority does not wish to give assent to the draft licence as it stands***

537. Where it wishes to see amendments to the licence conditions, the local authority may seek to agree amendments with HSE and the applicant before the application goes to a hearing.

538. The local authority may either assent, or refuse to assent, to the application. Where the authority refuses its assent, the application should be remitted to HSE with a statement setting out the reasons for refusal.

### **Appeal process**

539. In cases where the local authority refuses to assent to the application, or if the applicant disagrees with any conditions imposed by HSE, the applicant may, under provisions in section 44 of the Health and Safety at Work etc Act 1974, appeal against the decision. A similar right of appeal would apply in cases where HSE refuses to issue a draft licence (Details of how to appeal are given in paragraphs 555 and 556).

### **Regulation 15 Refusals of licences, registration and draft licences**

15.—(1) Subject to regulation 18, the licensing authority shall —

- (a) refuse an application for a licence or registration; and
- (b) where regulation 14(1) applies, refuse to issue the draft licence referred to in regulation 14(1),

where paragraph (2) applies.

(2) This paragraph applies when the licensing authority is of the opinion that —

- (a) the proposed site or, within it, any place where the manufacture or storage of explosives is proposed to take place is unsuitable for that manufacture or storage; or
- (b) the applicant is not a fit person —
  - (i) to store explosives, in the case of an application for registration or a licence to store explosives; or
  - (ii) to manufacture explosives, in the case of an application for a licence to do so.

(3) A refusal by the licensing authority, pursuant to paragraph (1), to issue the draft licence referred to in regulation 14(1) shall be treated for the purposes of these Regulations as a refusal of an application for a licence and the provisions of regulation 18 shall apply to a refusal to issue a draft licence as if the references in that regulation to “refuse an application for a licence” included refusing to issue a draft licence.

### **Guidance**

540. Regulation 15 requires the licensing authority to refuse an application for a licence or registration where it considers that the proposed site is unsuitable for the manufacture or storage of explosives, this might for example be due to:

- bulk storage of flammable substances at or in the immediate area of a site so that there would be a substantial risk that an explosion at the store would cause a fire in the flammables, or a fire involving the flammables could spread to an explosive building;

- the presence of hazardous substances at or in the immediate area of the site so that there is a significant risk that an explosion at the site would cause the release of hazardous substances into the wider area;
- proximity of telecommunications transmitters where there is a significant risk that the electromagnetic energy from the transmitters could initiate an explosion in the explosives;
- the presence of methane at the site or at an adjoining site (for example from a landfill site) so that there is a significant risk that a fire or explosion involving methane could spread to the explosives;
- the presence at or in the immediate area of the site of gas pipelines or high-voltage electricity supply so that there would be a significant risk that an explosion involving the explosives would result in significant 'knock-on' consequences.

**541.** The local authority may also refuse a licence if it believes that the storage would present an unacceptable risk to people living in adjoining residential premises. see also paragraph 0.

**542.** In addition, the local authority may refuse the licence due to the presence of vulnerable sections of the population (young children, the sick or elderly) in the immediate area of the site: for example, if a building housing a school, hospital or old people's home were immediately adjoining an explosives site):The local authority may also refuse a licence if it believes that the applicant is not a fit person to manufacture or store explosives - for example, the licensing authority does not have confidence in the individual's willingness or ability to abide by the Regulations or licence conditions (see paragraphs 549-552 for further guidance).

## **Cautions?**

### **Regulation 16**

### **Variation of licences**

**16.—**(1) The licensing authority which grants a licence may vary it —

- (a) where there has been a change in circumstances such that the separation distances can no longer be maintained and a consequent reduction in the maximum amount of explosive that may be stored is required;
- (b) (where the Executive is the licensing authority in cases where the assent of the local authority was required pursuant to regulation 13(3) before the grant of the licence) where there has been a material change in circumstances so that a variation is necessary to ensure safety; or
- (c) in relation to any of the matters it relates to, by agreement with the licensee.

(2) A licence may be varied on the grounds referred to in paragraph (1)(a) or (b) without the agreement of the licensee, subject to regulation 18.

(3) Where the Executive is the licensing authority in cases where the assent of the local authority —

- (a) was required under regulation 13(3) before the grant of the licence, or
- (b) would have been so required but for the operation of regulation 27(4) or (13),

the provisions of regulation 14 shall apply in respect of a proposed variation referred to in paragraph (4).

(4) A proposed variation for the purposes of paragraph (3) is one which —

- (a) relates to changes in the permitted quantities or types of explosive as a result of which the licensee could be required to maintain a separation distance greater than the separation distance required before the variation and, in the opinion of the Executive or the local authority concerned, significant new [health and??] safety issues are raised by that proposed variation;
- (b) would increase the period of the licence by more than twelve months; or
- (c) would remove the period of the licence so that it would be unlimited as to time,

and the Executive shall refuse to grant a varied licence unless the local authority, or each local authority in the case referred to in regulation 13(3), has so assented.

(5) In this regulation any reference to varying a licence includes varying its conditions.

## Guidance

**543.** Regulation 16 sets out the mechanism for amending a licence. The licence would normally be amended by agreement between the licensee and the licensing authority. However there may be circumstances when the licensing authority might amend the licence without the agreement of the licensee.

**544.** Paragraph 3 of regulation 16 covers cases where the licence originally required local authority assent. The first part of the paragraph states that the variation needs to go to assent if *either* the local authority or HSE takes the view that the amended licence raises significant new health and safety issues justifying a further assent hearing. Put another way, the application does not go to assent if HSE and the local authority agree that it does not present new issues. This would be likely to be the case if for example:

- the amendments involve minor administrative changes; or
- explosives of a high hazard type are replaced by explosives of a lower hazard type.

**545.** HSE will provide specific advice to local authorities should the need arise.

**546.** Regulation 16 also provides for situations where the duration of a time-limited licence is changed. HSE normally grants licences for an indefinite period. In certain circumstances, however, it might grant a



temporary licence for a defined period. If the local authority gives its assent to the granting of a licence on the basis that it is temporary, and the applicant subsequently wishes to make the licence permanent then a further assent hearing would be required.

### **Regulation 17                      Revocation of licences and registration**

**17.—(1)** The licensing authority which grants a licence or registers a person under regulation 11 may, subject to regulation 18, revoke that licence or registration —

- (a) where there has been a change in circumstances such that the site or, within it, any place in which explosives are manufactured or stored which the licence or, as the case may be, registration relates to is no longer suitable for that manufacture or storage of explosives;
- (b) where it appears to the licensing authority on information obtained by it after the grant of the licence or registration that the licensee or registered person is not a fit person —
  - (i) to store explosives, in the case of an application for registration or a licence to store explosives; or
  - (ii) to manufacture explosives, in the case of an application to manufacture explosives;
- (c) by agreement with the licensee or registered person.

**(2)** A person whose licence or registration is revoked shall ensure that —

- (a) all explosives are removed from a site as soon as is practicable after revocation of a licence or registration in respect of that site;
- (b) those explosives are deposited at a site which is the subject of a licence or registration or suitable arrangements are made for those explosives to be disposed of; and

the licence or certificate of registration is returned to the licensing authority within 28 days of the date that the revocation takes effect pursuant to regulation 18(4).

### **Guidance**

**547.** Regulation 17 permits the licence or registration to be revoked in three situations.

**548.** The first set of circumstances is where the licensing authority considers that the place of manufacture or storage is no longer suitable due to development on neighbouring land.

**549.** The second set of circumstances is where it appears to the licensing authority that the licensee or registered person is not a fit person to manufacture or store explosives. The fact that a person has committed a breach of the licence or the Regulations is not in itself necessarily grounds for regarding them as unfit to hold a licence. The concept of an unfit person implies that the licensing authority does not have confidence in the individual's willingness or ability to abide by the Regulations or the licence conditions, ie it has grounds for believing that there is a significant risk of a further breach. This decision will always need to be taken on a case-by-case basis, taking into account the circumstances of each individual case. However, examples of circumstances where the licensing authority might take this view are:

- a serious breach where there was evidence of a deliberate disregard of the Regulations and/or licence conditions; and
- a breach following a previous warning (including an improvement notice or prohibition notice).

**550.** In cases where breaches are due to incompetence, rather than to deliberate disregard of the law or of previous warnings, it may be more appropriate for the licensing authority to take enforcement action (such as the issue of improvement or prohibition notices, or a formal caution) in order to give the person the opportunity to comply with legal requirements. Clearly, if the person then fails to comply with enforcement action and/or continues to demonstrate incompetence, the licensing authority may then conclude that he or she is not a fit person and consequently, refusal or revocation of the registration or licence may be appropriate.

**551.** In considering whether a person is fit or not, the licensing authority will be primarily concerned to consider whether it has evidence to give it reasonable grounds for believing that the person cannot be relied upon to store the explosives without risk to public safety. In considering this, the licensing authority will be primarily looking at evidence of breaches of the licence or of other health and safety legislation. However, the licensing authority may also have regard to breaches of other relevant legislation such as the Fireworks Safety Regulations, but only in so far as these breaches provide evidence that the person is no longer fit to store the explosives.

**552.** It is also important to note that the 'fit person' test under these Regulations is not the same test as the fit person test under the Control of Explosives Regulations. The most important difference is that anyone who has served a custodial sentence is regarded as a 'prohibited person' and may not receive an explosives certificate. This is not the case with the storage of explosives. The Control of Explosives Regulations effectively require the chief police officer to carry out positive background checks to confirm that the applicant is a fit person - this is not the case here. The licensing authority will only consider whether on the evidence in its possession it has any reason to believe that the applicant is not a fit person.

**The third set of circumstances is by agreement between the licensing authority and the licensee or registered person. In effect, the licensee agrees to surrender his or her licence.****Regulation 18 Further provisions concerning refusals, variations and revocations**

18.—(1) Where a licensing authority proposes to —

- (a) refuse an application for a licence or registration;
- (b) vary a licence without the agreement of the licensee; or
- (c) revoke a licence or registration,

it shall, before taking any such action, notify the applicant, licensee or registered person, as the case may be, of its proposed course of action and afford him the opportunity of making representations to the licensing authority about it, within a period of 28 days from the date of the notification.

(2) Representations made for the purpose of paragraph (1) may be made in writing, or both in writing and orally.

(3) Where the licensing authority decides to —

- (a) refuse an application for a licence or registration;
- (b) vary a licence without the agreement of the licensee; or
- (c) revoke a licence or registration,

it shall provide in writing to the applicant, licensee or registered person, as the case may be, the reasons for its decision.

(4) Where the licensing authority varies a licence without the agreement of the licensee or revokes a licence or registration, that variation or revocation shall take effect from a date to be determined by the licensing authority which shall be a date after the 28 day period referred to in paragraph (1).

### **Guidance**

553. Regulation 18 requires the licensing authority to notify the applicant, licensee or registered person in cases where it proposes to refuse or revoke a licence or registration, or vary a licence without the licensee's agreement. The person concerned may, within 28 days of the notification, make representations to the licensing authority.

554. Where the licensing authority decides to refuse or revoke a licence or registration, or vary a licence without the licensee's agreement, it must write to the person concerned, giving its reasons for the decision.

### **Regulation 19 Appeal against refusal or revocation of registration**

19. A person may appeal to the Secretary of State against a decision of a licensing authority to refuse to register him or to revoke his registration and the provisions of section 44(2) to (6) of the 1974 Act<sup>(a)</sup> (appeals in connection with licensing provisions) shall apply in respect of any such appeal.

### **Guidance**

555. Regulation 19 contains provisions for appeal against the refusal or revocation of a registration. It should be

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<sup>(a)</sup> 1974 c.37; section 44 is amended by the Employment Protection Act 1975 (c.71), sections 116 and 125(3), Schedule 15, paragraph 13 and Schedule 18 and by the Tribunals and Inquiries Act 1992 (c.53), section 18(1) and Schedule 3, paragraph 9.

noted that section 44 of the Health and Safety at Work etc Act 1974 already contains provisions for appeal against the repeal or revocation of licences. Regulation 19 extends the rights of appeal to cover registrations.

**556.** Appeals should be addressed to the Secretary of State for Work and Pensions, Richmond House, 79 Whitehall, London SW1A 2NS (Tel: 020 7238 0800).

#### **Regulation 20                      Transfer of licences and registration**

**20.—(1)** A licence or registration may be transferred in writing by —

- (a) the licensee or person who is registered; or
- (b) the licensing authority which issued the licence or registration following the death or incapacity of the licensee or person who is registered,

to any other person who wishes to manufacture or store explosives in place of the licensee or the person who is registered.

(2) Where the licensee or person who is registered wishes to transfer the licence or, as the case may be, the registration, he shall notify the licensing authority which issued the licence or the registration of the name and address of the proposed transferee at least 28 days before the licence or registration is transferred.

#### **Guidance**

**557.** Regulation 20 enables a licence or registration to be transferred to another person (including another business).

#### **Regulation 21                      Death, bankruptcy or incapacity**

**21.—(1)** If a licensee or registered person dies or becomes incapacitated, a person manufacturing or storing explosives in accordance with the terms of the first-named person's licence or registration shall be treated as being licensed or registered in accordance with the first-named person's licence or registration until either —

- (a) the expiration of 28 days from such death, bankruptcy or incapacity; or
- (b) the grant or refusal of a new licence or registration,

whichever is the earlier.

(2) If a licensee or registered person becomes bankrupt or, in the case of a company, goes into liquidation or receivership or has a receiving order made against it, any receiver, trustee in bankruptcy or liquidator shall be treated as being the licensee or registered person.

#### **Guidance**

**558.** In relation to regulation 21(1), a licensee or registered person would become 'incapacitated' in situations where they are, or consider themselves unable to continue to meet their duties in terms of the licence or registration.

**559.** In situations where a licensee's business is put in the hand of a receiver or a liquidator, the licence responsibilities automatically transfer with the business. The receiver or liquidator therefore becomes responsible for the licence while the business is in their hands.

## **Regulation 22                      Registers and retention of documents**

22.—(1) The licensing authority shall —

- (a) maintain a register in accordance with Schedule 4;
- (b) keep a copy of any licence granted or certificate of registration issued by it (together with a copy of the application for the licence or registration) for as long as the licence or registration remains valid; and
- (c) (except where the Executive is the licensing authority), send to the Executive on request a copy of any part of the register or other document specified in this paragraph within such time as the Executive may direct.

(2) For the purposes of this regulation and Schedule 4, in the case to which regulation 3(5) applies disapplying regulations 5 and 9 to 21, any reference to —

- (a) the licensing authority or licensee shall be construed as a reference to the Secretary of State for Defence;
- (b) any licence granted shall be construed as a reference to the scheme referred to in regulation 3(5);
- (c) separation distances shall be construed as a reference to the separation distances prescribed in the scheme approved by the Secretary of State for Defence.

### **Guidance**

560. Regulation 22 requires licensing authorities to maintain a register containing details of the licences and certificates of registration it has issued.

#### ***Information to be included in the register***

561. Schedule 4 states the nature of the information to be contained in the register. For ease of reference the key points are included here. These are:

- the name of the licensee or person registering the premises;
- the permanent address of the licensee or registered person (unless the person's home address is their only permanent address, in which case the address should not be entered in the register);
- the address of premises where explosives are manufactured or stored (where this is different from above);
- details of the hazard type and quantity of explosives which may be stored;
- the nature of the business of the licensee or registered person and the intended use of the explosives;
- the kind of explosives manufactured or stored;
- a plan of sufficient scale to show accurately the separation distances to be maintained around the store or building where explosives are manufactured;
- a map showing the location of any stores; and

- the kind of store, including details of its construction.

***Access to information in the register***

**562.** The requirements on access to the information contained in the register depend on the nature of the explosives that are recorded there. For explosives that do not require a certificate to acquire and keep explosives the local authority is required to make available for inspection by members of the public the following information:

- the name of the licensee or registered person;
- their permanent address (unless their home address is their only permanent address):
- the address of the site where the explosives are manufactured or stored; and
- the hazard type and maximum amount of explosives which may be stored at any one time.

**563.** Where the explosives require a certificate to acquire and keep, the rights of access to the information listed in paragraph 562 are limited to those living, or with a business, in the immediate area of the explosives site (ie within the public consultation zone for the site).

**564.** Those with the right of access may inspect the information covered in paragraph 562 at any reasonable time, free of charge. On request, the licensing authority will provide, at a reasonable charge, copies of the relevant register entries.

**565.** It is important to note that licensing authorities are not required to provide the information covered in paragraph 562 in cases where the licence or registration relates only to the storage of:

- less than 500kg of hazard type 1 or 2 explosives;
- less than 2000kg of hazard type 3 or 4 explosives; or
- any explosives stored for less than four weeks.

However, the licensing authority is required to keep a record of the information referred to in paragraph 561.

**566.** Licensing authorities may keep the register in paper or electronic form, or both, as they think fit. However, it is strongly recommended that appropriate arrangements are made to safeguard records against accidental loss.

## **Regulation 23                      Defences**

**23.**—(1) In proceedings against a person for a contravention of regulation 9(1) which involves using a building or part of a building licensed for the manufacture of explosives, for another manufacturing process not specified in the licence, it shall be a defence for that person to prove that —

- (a) that use was temporary;
- (b) that other process of manufacture involved explosive of the same, or a lower, hazard type than the explosives which the conditions of the licence permit in, as the case may be, that building or part of a building;
- (c) the maximum quantity of explosives in, as the case may be, that building or part of a building at any one time permitted under the conditions of the licence was not exceeded; and

he informed the Executive as soon as is reasonably practicable after the start of that use.

(2) In proceedings against a person for a contravention of regulation 10(1), it shall be a defence for that person to prove that the storage of explosives without a licence or in breach of a condition of a licence was caused by an emergency being an emergency which that person took all reasonable precautions and exercised all due diligence to avoid.

(3) In proceedings against a person for a contravention of regulation 10(1) where it is alleged against that person that the storage concerned was for a period longer than a period (“the permitted period”) referred to in regulation 10(2)(c), (d), (e) or (f)(i) or (ii), it shall be for that person to prove that the storage concerned was for no longer than the relevant permitted period.

- (a)

## **Guidance**

**567.** Regulation 23(1) provides for circumstances where, owing to an emergency, explosives must be stored in a building which is unlicensed, or the permitted quantity is exceeded. The regulation requires the licensee to inform the HSE as soon as is reasonably practicable afterwards.

**568.** Regulation 23(2) provides for other emergencies. However it is important to note the words ‘being an emergency which that person took all reasonable precautions and exercised all due diligence to avoid’. This provision does not provide a defence in circumstances where the dutyholder had failed to take reasonable measures to anticipate circumstances which could have been reasonably foreseen.

**569.** Regulation 23(3) applies in cases where storage without a licence is permitted subject to a time limit. In the event of a prosecution for storage without a licence, the person storing the explosive would have to demonstrate that they had complied with the relevant permitted period. It is recommended that where explosives are to be stored under these provisions that the person storing should maintain suitable documentary evidence – such as delivery notes to enable them to demonstrate compliance with the conditions of the disapplication.

## **PART IV**

## PROHIBITIONS CONCERNING CERTAIN EXPLOSIVES AND MISCELLANEOUS PROVISIONS

### Regulation 24 Prohibition concerning the manufacture, storage and importation of certain explosives

24.—(1) Subject to paragraph (2), no pyrotechnic which consists of —

- (a) sulphur; or
- (b) phosphorus,

mixed with chlorate of potassium or other chlorates or which contains any such mixture shall be manufactured, stored or imported.

(2) This regulation does not apply to any pyrotechnic named in a list, approved by the Executive, of pyrotechnics falling within the description referred to in paragraph (1).

(3) A contravention of paragraph (1) concerning importation shall be punishable only under the 1974 Act.

### Guidance

570. Anyone wishing to manufacture, import or store any pyrotechnic article containing these mixtures would need to apply to HSE for the article to be added to the approved list. For further information please contact:

HSE Explosives Inspectorate  
Merton Road  
Bootle  
Merseyside L20 7HS  
Tel: 0151 951 4000

e-mail: [explosives.licensing@hse.gsi.gov.uk](mailto:explosives.licensing@hse.gsi.gov.uk)

### Regulation 25 Prohibition concerning the acquisition and supply of fireworks

25.—(1) No person shall —

- (a) acquire more than 50 kilograms of fireworks unless he (“Person A”) or another person holds a valid licence or certificate of registration for the storage by Person A of those explosives; or
- (b) sell or otherwise transfer to any person (“Person B”) more than 50 kilograms of fireworks unless Person B shows a valid licence or certificate of registration for the storage by Person B of those explosives, to the person selling or otherwise transferring the explosives.

(2) This regulation does not apply to a person who is transporting explosives on behalf of another person.

### Guidance

571. Regulation 25 prohibits anyone acquiring more than 50kg of fireworks without a licence or registration. It also prohibits the sale or transfer of more than 50 kg of fireworks unless the person to whom the fireworks are being sold or transferred shows a valid licence or registration.

572. Carriers who transport fireworks do not need to have a registration certificate or licence. However, the



person selling or transferring the fireworks must have the assurance that those receiving the delivery do have a valid certificate or licence. For example, this may involve the recipient showing or sending the supplier a copy of the certificate or licence in advance of the delivery. Alternately, if appropriate, a copy of the certificate or licence may be sent with carrier picking up the delivery from the supplier.

**573.** It is not necessary for a supplier who has already seen a copy of a certificate or licence to see a further copy for deliveries made within the period that the certificate or licence is valid.

**574. NEED TO REDRAFT IN THE LIGHT OF FIREWORK REGULATIONS**

It is strongly recommended that anyone selling or transferring more than 50 kg of fireworks keeps a record of whom they have sold or transferred the fireworks to and/or keeps a copy of their registration certificate or licence.

**Regulation 26 Power to grant exemptions**

**26.**—(1) Subject to paragraph (2), the Executive may, by a certificate in writing, exempt any person or class of persons or any explosive or class of explosives from any requirement or prohibition imposed by these Regulations, and any such exemption may be granted subject to such conditions and to a limit of time and may be revoked in writing at any time.

(2) The Executive shall not grant any such exemption unless, having regard to the circumstances of the case, and in particular to —

- (a) the conditions, if any, which it proposes to attach to the exemption; and
- (b) any other requirements imposed by or under any enactment which apply to the case,

it is satisfied that the health and safety of persons who are likely to be affected by the exemption will not be prejudiced in consequence of it.

(3) The Secretary of State for Defence may, in the interests of national security, by a certificate in writing, exempt any of Her Majesty's Forces, any visiting force, any headquarters or any civilian employee or class of civilian employees of the Ministry of Defence from all or any of the requirements or prohibitions imposed by these Regulations and any such exemption may be granted subject to conditions and to a limit of time and may be revoked by the said Secretary of State by a further certificate in writing at any time.

**Guidance**

**575.** Regulation 26 enables HSE to grant exemptions. Applications for exemptions should be made to:

HSE Explosives Inspectorate  
Merton Road  
Bootle  
Merseyside L20 7HS  
Tel: 0151 951 4000  
E-mail:

[explosives.enquiries@hse.gsi.gov.uk](mailto:explosives.enquiries@hse.gsi.gov.uk)

**Guidance**

**576.** HSE is required to ensure that standards of safety will not be prejudiced by an exemption. The applicant for any exemption should carefully explain which particular provision cannot be observed and why, and also propose alternative methods for maintaining an equivalent standard of safety.

**Regulation 27 Savings and transitional provisions**

**27.—**(1) A licence, amending licence, continuing certificate or store licence granted or issued under, as the case may be, section 8, 12, 14 or 15 of the 1875 Act or a licence granted under article 3 of the Ammonium Nitrate Mixtures Exemption Order 1967<sup>(a)</sup> which was valid immediately before the relevant date shall be deemed to be a licence granted under regulation 13 and shall continue in force, notwithstanding the repeal by these Regulations of those provisions, on its existing terms and conditions, subject to —

- (a) any variation under regulation 16(1)(a) to (c);
- (b) any variation for the purpose of requiring the licensee to maintain a separation distance greater than a separation distance which is required before the variation; or
- (c) its expiry on the date it was due to expire or its revocation under regulation 17, whichever is the sooner.

(2) A registration effected under section 21 of the 1875 Act which was valid immediately before the relevant date shall be deemed to be a registration under regulation 11 and shall continue in force, notwithstanding the repeal by these Regulations of the said section 21, until the date it was due to expire or it is revoked, whichever is the sooner.

(3) Where the manufacture or storage of explosives at any place —

- (a) was immediately before the relevant date exempt from—
  - (i) the provisions of the 1875 Act by virtue of section 97 of that Act<sup>(b)</sup>; or
  - (ii) the requirement for a licence in respect of such manufacture or storage under that Act by virtue of an exemption certificate granted under the Explosives Act 1875 (Exemptions) Regulations 1979<sup>(c)</sup>; and
- (b) is not manufacture or storage which regulation 3(5) relates to,

the person carrying on such manufacture and storage shall be deemed to hold a licence granted by the Executive under regulation 13 with an expiry date of 1st January 2008.

(4) In a case to which paragraph (3) applies, regulation 13(3) shall not apply in relation to an application for a licence made to, and received by, the Executive before 1st January 2008.

(5) In relation to the application of these Regulations to the manufacture of any ammonium nitrate blasting intermediate by virtue of regulation 2(2), where a person is manufacturing any ammonium nitrate blasting intermediate on the relevant date, regulations 9, 12, 13, and 15 to 23 shall not apply to that manufacture by that person until 1st January 2008.

(6) The requirements of regulation 5 and Schedule 2 shall not apply to a police force storing explosives until 1st January 2008.

(7) The requirements of regulation 5 and Schedule 2 shall not apply until 1st January 2010 to a person who stores explosives in respect of which storage there is a deemed registration in force on the relevant date.

(8) The requirements of regulation 5 and Schedule 2 shall not apply until 1st January 2008 to a person who stores explosives in respect of which storage there is a deemed licence in force on the relevant date.

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<sup>(a)</sup> S.I. 1967/1485.

<sup>(b)</sup> 1875 c.17 (38 & 39 Vict. ); section 97 was amended by the Statute Law Revision (No. 2) Act 1893 (56 & 57 Vict. c.14), the Statute Law Revision Act 1966 (c.5), S.I. 1964/488 and 1989/615.

<sup>(c)</sup> S.I. 1979/1378.

(9) A person who —

- (a) has a deemed licence in respect of the storage of explosives, or
- (b) has a deemed licence which has expired and been replaced by a licence granted under regulation 13 in respect of that storage,

may apply at any time to the Executive, which shall be the licensing authority for a licence in respect of that storage, to replace that existing one, which provides for different separation distances to apply in respect of that storage to any which would otherwise to apply on and after 1st January 2008 under regulation 5 and Schedule 2.

(10) An application for a licence pursuant to paragraph (9) shall not be granted by the Executive unless the Executive is satisfied that it would not be reasonably practicable for the applicant to comply with the separation distances the subject of the application required by regulation 5 and Schedule 2.

(11) Where, on the relevant date, a person holds more than one deemed licence, each relating to the storage of explosives at separate places within the same site and the aggregate total of explosives allowed to be stored at that site pursuant to those deemed licences exceeds 2 tonnes, that person shall apply before 1st January 2008 to the Executive, which shall be the licensing authority, for a licence to replace those deemed licences, for the storage of any explosives that he wishes to store at that site; and, on the date that a licence is granted pursuant to such an application, any such deemed licence shall be treated as revoked under regulation 17 as from that last mentioned date.

(12) Where, before the relevant date, a person would not have been required to apply for a licence under the 1875 Act because he was manufacturing or storing explosives in a part of premises already licensed under that Act to cover that manufacture or storage but, by virtue of regulation 9(1) or 10(1) he would need to hold a licence in respect of such manufacture or storage on and after that date —

- (a) he shall have until whichever is the sooner of [ 200?], or the expiry or revocation of any deemed licence in respect of those premises, to apply for a licence under these Regulations for that manufacture or storage; and
- (b) regulations 9(1) and 10(1) shall not apply to him until [??].

**[OR instead of (a) and (b):** he shall be deemed to hold a licence under these Regulations containing the same terms and conditions as the existing licence included in relation to that manufacture or storage until [... 200?] and shall have until that date to apply for a licence under these Regulations in respect of such manufacture or storage carried on by him thereafter.

(13) Regulation 13(3) shall not apply in relation to an application for a licence which paragraph (9), (11) or (12) relates to, save where —

- (a) if the licence applied for were to be granted, it would result in an increase in the quantity, or a change in the hazard type, of any explosive presently permitted at the site under a deemed licence; or
- (b) the application is received by the Executive after 1st January 2006; or
- (c) the application is for a licence to replace a deemed licence which was, before the relevant date, a store licence granted by a local authority under section 15 of the 1875 Act on or after *[a date which is one month after commencement??]* 2004.

(14) Where an application for a licence pursuant to section 6 of the 1875 Act<sup>(a)</sup> is made to, and received by, the Executive before the relevant date and the application has not been refused nor granted by that date, the application shall be deemed to be an application for a licence under these Regulations and the provisions of these Regulations shall apply to the application accordingly, subject to the paragraph (14) in relation to the application of any requirements of regulations 13(3) and 14 to any such application.

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<sup>(a)</sup> Section 6 was amended by the Explosives Acts 1875 and 1923 etc (Repeals and Modifications) Regulations 1974 (S.I. 1974/1885).

(15) In relation to the application of the requirements of regulations 13(3) and 14 to an application which paragraph (14) relates to —

- (a) a draft licence approved by the Executive pursuant to section 6 of the 1875 Act before the relevant date, shall be deemed to be a draft licence for the purposes of regulation 14(1);
- (b) where notice under section 7 of the 1875 Act in respect of the application and of the time and place at which the local authority will be prepared to hear the applicant has been published before the relevant date —
  - (i) the provisions of regulation 14(3) and (8) relating to notices shall not apply, and
  - (ii) if the hearing to which the notice relates would be held or continue to be held on or after the relevant date, it may continue to be so held and it shall be deemed to be a hearing for the purposes of regulation 14;
- (c) where a notice under section 7 of the 1875 Act referred to in subparagraph (b) has not been published before the relevant date, regulation 14(3) shall have effect as if after “paragraph (2)” there were inserted “or within 28 days of the coming into force of these Regulations, whichever is the later.”;
- (d) the assent to the application by the local authority pursuant to section 7 of the 1875 Act, or the assent by both local authorities to the application where the assent of both is required under that section, given before the relevant date shall be deemed to be assent for the purposes of regulations 13(3) and 14 and the Executive shall grant a licence under regulation 13 which accords with the draft licence approved by the Executive pursuant to section 6 of the 1875 Act, with the addition, if the assent was on conditions submitted to by the applicant, of the additional restrictions and precautions required by those conditions.

(16) An application for an amending licence under section 12 of the 1875 Act which is made to and received by, but not decided by, the Executive before the relevant date, shall be deemed to be an application for a variation of a licence under these Regulations and the provisions of these Regulations shall apply to the application accordingly.

(17) Despite the repeal by these Regulations of section 40 of the 1875 Act, paragraph (9) of that section (as it had effect before the commencement of Schedule 4 to the Placing on the Market and Supervision of Transfers of Explosives Regulations 1993<sup>(a)</sup>) shall continue to apply to acetylene as it applied before the commencement of these Regulations.

(18) Notwithstanding the repeal by these Regulations of sections 40(4) and 50 of the 1875 Act, Order in Council (No. 9) of 27th November 1875 relating to the Sale of Explosive<sup>(b)</sup> shall continue in force.

(19) Notwithstanding the provisions of Schedule 1, the licensing authority functions allocated to the chief officer of police under that Schedule shall not take effect until 1st January 2005 and for the period before that date those licensing authority functions of the chief officer of police shall be carried out by the local authority for the area in which the storage of the explosives is to take place.

(20) For the purposes of this regulation —

- (a) “deemed licence” means any licence, amending licence, continuing certificate or store licence deemed by virtue of paragraph (1) to be a licence granted under regulation 13 and includes a licence deemed to be held by a person pursuant to paragraph (3) and “deemed licensee” shall be construed accordingly;
- (b) “deemed registration” means a registration deemed by virtue of paragraph (2) to be a registration under regulation 11; and
- (c) “relevant date” means the date when these Regulations come into force.

## Guidance

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<sup>(a)</sup> S.I. 1993/2714..

<sup>(b)</sup> Rev. VII, p 39.

577. [Need to update guidance to Reg 27 when Reg finalised] Regulation 27 sets out the transitional arrangements for those people who held licences (or had pending applications for licences or amending) at the time the Regulations come into force.

578. The most basic provision is that existing licences and registrations continue to be valid. HSE licences granted without a time limit continue in force as before. Local authority licences and registrations will continue until their existing end date.

#### ***Licensing authority***

579. In some cases the licensing authority will change with the introduction of the Regulations. Most of the licensees affected by this change will be quarries holding explosives that require a police explosives certificate. Licensees will need to renew their licences with the police. The police will normally send out a renewal notice advising storeholders where to apply for a renewal of their licence or registration. If licensees are in any doubt as to the next steps they should contact their police explosives liaison officer (contact details for police explosives liaison officers are available on HSE's web-site under "explosives").

580. Regulation 27 also sets out the arrangements for the coming into force of the revised requirements on separation distances. In most cases the distances will remain the same or even decrease. Licensees may benefit from any reduction in the separation distance immediately.

#### ***Manufacturers of ammonium nitrate blasting intermediates***

581. Paragraph 5 gives manufacturers of ammonium nitrate blasting intermediates until [1 July 2007] to comply with the licensing requirements.

#### ***Separation distances***

582. The Regulations also set out special arrangements where the Regulations would involve an increase in the separation distance.

583. It is important to note that the provisions differ depending on whether the store is registered or licensed.

584. Where the store was registered at the time the Regulations came into force, Paragraph 7 applies and the holder of the store has until [1 Jan 2010] to comply with the new requirements.

585. Where the store is licensed (at the time of the Regulations come into force) the holder of the licence has until [1 Jan 2007] to comply. However, paragraph 9

also gives the option of applying to HSE for a licence: HSE has the discretion to accept different distances from those required by Schedule 2 and in principle could accept additional safety measures (such as 'unitisation' to divide the explosives into units and thus reduce the amount of explosives involved in an explosion) in exchange for a reduction in the required separation distances.

**586.** It is important to stress that the licensee will need to demonstrate that it is not reasonably practicable for them to comply with the separation distance requirements. For example, if they could comply by making a small reduction in the amount of explosive they hold, or by removing the detonator annex or mounding the store, then HSE would not be able to issue a licence under regulation 27. On the other hand if the licensee would otherwise be required to relocate to a new site or to purchase a new store then there would be a case for consideration under this regulation.

**587.** It may be that the licences granted under this regulation involve a combination of a reduction in the amount of explosives kept, together with a reduction in the required separation distances in exchange for alternative safety measures. While HSE's aim will be to assist in mitigating the impact of the separation distance requirements, its priority is to ensure adequate levels of safety. The transitional provisions do not provide an entitlement for existing licence holders to continue to maintain their existing licence maximum quantities.

**588.** The normal assent process would not apply providing that:

- the quantity of explosives to be kept is not increased, or the explosives are the same or a less hazardous hazard type. In other words, provided the activity remains the same and the level of hazard it presents remains the same or is reduced; and
- the application for the new licence is made by [1 Jan 2006]

**589.** It is important to note that until a licence is granted by HSE, the local authority continues to be the licensing authority for the store. The storeholder will continue to need to renew the store licence.

#### ***Multiple licensed stores at one site***

**590.** Very similar arrangements will apply where the licensee has two or more licensed stores at the site holding a combined total of more than 2000kg.

### ***Government-owned stores***

591. Section 97 of the Explosives Act disapplied the Act from factories and stores "under the control of a Secretary of State, or other department of the Government, or otherwise held for the service of the Crown". These Regulations apply to the Crown. Most of the premises that were previously not subject to the Explosives Act are under the control of the Ministry of Defence (MoD). Under regulation 3 these will be covered by a scheme set up by the Secretary of State for Defence. Paragraph 4 provides for sites that are Government-owned but are not under the control of the MoD. These sites are deemed to be operated under an HSE licence until the [1 Jan 2008]. This gives the operators of these sites until that date to agree a licence with HSE that will continue after that date. Again, provided the activity and levels of hazard are unchanged these licences will not require the assent of the local authority.

### ***Licence applications***

592. Paragraph 13 of Regulation 27 sets out the provisions for applications for HSE licences. These are intended to ensure that the application made under the new Regulations can continue to the next stage under the new Regulations. For example:

- if the local authority has given its assent but the licence has not yet been confirmed, the local authority assent remains valid for the new regulations;
- similarly, if the notices for a hearing have been published then the requirements of Regulation 14(3) are deemed to have been met and the hearing can be held under the new regulations.

593. Similarly, applications for amendments to HSE licences can be taken forward under Regulation 15 of these Regulations.

594. No similar provisions have been made for local authority licences because the application process is much simpler. Applicants considering applying for a licence immediately before the coming into force of the new regulations should contact the relevant licensing authority for guidance. It should normally be possible to process the initial stages of the application so that the licence can be issued with the minimum delay following the coming into force of the new regulations.

### **Regulation 28                      Repeals, revocations and amendments**

28.—(1) The primary legislation specified in Part 1 of Schedule 5 and the secondary legislation specified in Part 2 of that Schedule shall be amended in accordance with the provisions of that Schedule.

(2) The primary legislation specified in column 1 of Part 1 of Schedule 6 shall be repealed to the extent specified in column 3 of that Schedule.

(3) The secondary legislation specified in column 1 of Part 2 of Schedule 6 shall be revoked to the extent specified in column 3 of that Schedule.

Signatory text

Address  
Date

*Name*  
Parliamentary Under Secretary of State  
Department for Work and Pensions



## SCHEDULE 1

Regulation 2(1)

### MEANING OF LICENSING AUTHORITY

1. Subject to regulation 27(9), (11) and (18) and paragraphs 2 and 3, “licensing authority” means

- (a) in relation to an application for registration, or for a licence for the storage within one site of no more than 2000 kilograms of explosives —
  - (i) to which paragraph (a)(i) of the definition of “explosive” in regulation 2(1) applies —
    - (aa) the chief officer of police for the area in which the storage is to take place where any of the explosives are of a type not listed in Schedule 1 to the Control of Explosives Regulations 1991<sup>(a)</sup>;
    - (bb) the local authority for the area in which the storage is to take place where all the explosives are of a type listed in Schedule 1 to the Control of Explosives Regulations 1991; or
    - (cc) the Executive where the explosives are to be stored at a mine or within a harbour; or
  - (ii) to which paragraph (b) of the definition of “explosive” in regulation 2(1) applies, the chief officer of police for the area in which the storage will take place;
- (b) where the application for a licence relates to the manufacture of any ammonium nitrate blasting intermediate, the Executive;
- (c) in relation to an application for a licence in any other case, the Executive.

2. In any case falling with paragraph 1(a)(i)(aa) or (bb), the applicant may apply instead to the Executive for a licence, in which case the Executive shall be the licensing authority in place of the chief officer of police or local authority.

3. Where a person wishes to manufacture and store explosives at the same site, the Executive shall be the licensing authority in respect of any application for a licence relating to that site.

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<sup>(a)</sup> S.I. 1991/1531; amended by S.I. 1993/2714.

## SCHEDULE 2

Regulation 5(1)

### SEPARATION DISTANCES

1.—(1) In this Schedule —

“brick-built” means having an outer structure which is wholly or mainly of brick, concrete, stone or other similar material;

“distance”, save in the definition of “reference zone”, means the minimum distance;

“footpath” includes a bridleway or other thoroughfare which is not a road, but does not include a footpath used by no more than 20 persons every 24 hours;

“lightly-used road” means a road used by more than 20 and no more than 500 vehicles every 24 hours;

“major road” means a road used by more than 10,000 vehicles every 24 hours;

“minor road” means a road used by more than 500 vehicles every 24 hours, other than a major road;

“mounded” means surrounded by suitable mounds;

“reference zone” means the area around a store having the radius from the centre point of the store specified in column 5 of the relevant Table;

“road” means any thoroughfare suitable for the passage of vehicles;

“metal-built” means built wholly or mainly of steel or other metal;

“place of public resort” means a place where more than one hundred persons gather, or are likely to gather, at any one time on a weekly or more frequent basis;

“vulnerable building” means a building of four storeys or more above ground with a curtain-wall construction, that is to say where the masonry, glass or other cladding is suspended from the structural framework of the building;

“waterway” does not include a waterway navigated by no more than 20 persons every 24 hours,

and related expressions shall be construed accordingly.

(2) Any reference in this Schedule to a thoroughfare (however described), waterway or railway line does not include any part of a thoroughfare, waterway or railway line within the site —

- (a) in which the store is situated; and
- (b) which are occupied by the person storing the explosives.

(3) Any reference in this Schedule to a quantity of explosives shown in column 1 of a Table, is to a quantity stored which is more than the lower figure but not more than the higher figure in column 1 in the same row of the Table.

(4) Any reference in this Schedule to a building, is to a building in or at which people are, or are likely to be, present either all the time or from time to time.

(5) For the purposes of this Schedule, where explosives of different hazard types are in one store, the explosives shall be treated as belonging to the hazard type which would require the greatest separation distance for the total quantity of those explosives and the separation distance shall be determined in relation to that total quantity.

(6) For the purposes of this Schedule, the radius for a reference zone applying in a particular case is the number in the entry in column 5 of the relevant Table corresponding to the quantity of explosives shown in column 1 of the Table.

2. Where the storage is —

- (a) of hazard type 1 explosive in a brick-built mounded store, Table 1;
- (b) of hazard type 1 explosive in a brick-built unmounded store, Table 2;

- (c) of hazard type 1 explosive in a metal-built mounded store, Table 3;
- (d) of hazard type 1 explosive in a metal-built unmounded store with no detonator annex attached, Table 4;
- (e) of hazard type 1 explosive in a metal-built unmounded store with a detonator annex attached, Table 5;
- (f) of hazard type 2 explosive, some or all items being of more than 0.7 kg net mass, Table 6;
- (g) of hazard type 2 explosive, every item being of 0.7 kg net mass or less, Table 7;
- (h) of hazard type 3 explosive, Table 8;
- (i) of hazard type 4 explosive, Table 9;

shall apply, and any reference in this Schedule to a relevant Table is a reference to the Table which applies by virtue of this paragraph.

**3.** Subject to paragraphs 4 and 5, the distance between a store and any building, place of public resort or major road shall be the distance specified in the entry in column 2 of the relevant Table corresponding to the quantity of explosives shown in column 1 of the Table.

**4.** Subject to paragraph 5, where —

- (a) Table 1, 3, 4 or 5 applies; and
- (b) the number of dwellings in the reference zone is greater than the number specified in the entry in column 6 of the Table corresponding to the quantity of explosives shown in column 1 of the Table,

the distance between the store and any dwelling shall be the distance (if any) specified in the corresponding entry in column 3 of the Table.

**5.** The distance between a store and any vulnerable building shall be the distance (if any) specified in the column headed 'Vulnerable building distance' corresponding to the quantity of explosives shown in column 1 of the relevant Table.

**6.** The distance between a store and —

- (a) any minor road or any railway line shall be half; and
- (b) any lightly-used road, footpath or waterway shall be one-third,

the distance shown in column 2 of the Table.

**TABLE 1**  
HAZARD TYPE 1 EXPLOSIVES IN A BRICK-BUILT MOUNDED STORE

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
<i>Quantity of explosives (kg)</i>	<i>Low density distance (m)</i>	<i>High density distance (m)</i>	<i>Vulnerable building distance (m)</i>	<i>Reference zone radius (m)</i>	<i>Maximum number of dwellings in reference zone</i>
0.1 – 25	101	-	101	-	-
25 – 50	107	-	107	-	-
50 – 75	112	-	112	-	-
75 – 100	118	-	118	-	-
100 – 150	128	142	128	257	81
150 – 200	139	156	139	278	96
200 – 300	161	180	161	322	128
300 – 400	183	-	183	-	-
400 – 450	193	-	193	-	-
450 – 500	204	-	204	-	-
500 – 600	204	-	216	-	-
600 – 700	204	231	238	408	206
700 – 800	204	238	260	408	206
800 – 900	204	245	280	408	206
900 – 1000	204	250	300	408	206
1000 – 1100	204	255	319	408	206
1100 – 1200	204	259	337	408	206
1200 – 1300	204	263	354	408	206
1300 – 1400	204	266	370	408	206
1400 – 1500	204	269	386	408	206
1500 – 1600	204	272	402	408	206
1600 – 1700	208	274	416	416	214
1700 – 1800	215	277	431	431	229
1800 – 1900	222	279	444	444	244
1900 - 2000	229	281	458	458	259

**TABLE 2****HAZARD TYPE 1 EXPLOSIVES IN A BRICK-BUILT UNMOUNDED STORE**

<i>1</i> <i>Quantity of explosives (kg)</i>	<i>2</i> <i>Low density distance (m)</i>	<i>3</i> <i>Vulnerable building distance (m)</i>
0.1 – 25	141	141
25 – 50	160	160
50 – 75	180	180
75 – 100	199	199
100 – 150	230	230
150 – 200	256	256
200 – 300	293	293
300 – 400	320	320
400 – 450	331	331
450 – 500	340	340
500 – 600	355	355
600 – 700	367	367
700 – 800	377	377
800 – 900	385	385
900 – 1000	392	392
1000 – 1100	398	398
1100 – 1200	403	403
1200 – 1300	408	408
1300 – 1400	412	412
1400 – 1500	415	415
1500 – 1600	418	418
1600 – 1700	421	421
1700 – 1800	424	431
1800 – 1900	426	444
1900 – 2000	428	458

**TABLE 3****HAZARD TYPE 1 EXPLOSIVE IN A METAL-BUILT MOUNDED STORE**

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
<i>Quantity of explosives (kg)</i>	<i>Low density distance (m)</i>	<i>High density distance (m)</i>	<i>Vulnerable building distance (m)</i>	<i>Reference zone radius (m)</i>	<i>Maximum number of dwellings in reference zone</i>
0.1 – 25	34	45	40	68	6
25 – 50	37	45	48	74	7
50 – 75	40	45	54	80	8
75 – 100	43	48	66	86	9
100 – 150	49	55	86	97	12
150 – 200	54	62	104	109	15
200 – 300	68	76	136	136	23
300 – 400	83	-	165	-	-
400 – 450	89	-	178	-	-
450 – 500	96	-	191	-	-
500 – 600	108	-	216	-	-
600 – 700	119	-	238	-	-
700 – 800	130	-	260	-	-
800 – 900	140	-	280	-	-
900 – 1000	150	-	300	-	-
1000 – 1100	159	-	319	-	-
1100 – 1200	168	-	337	-	-
1200 – 1300	177	-	354	-	-
1300 – 1400	185	-	370	-	-
1400 – 1500	193	-	386	-	-
1500 – 1600	201	-	402	-	-
1600 – 1700	208	-	416	-	-
1700 – 1800	215	-	431	-	-
1800 – 1900	222	-	444	-	-
1900 – 2000	229	-	458	-	-

**TABLE 4**HAZARD TYPE 1 EXPLOSIVE IN A METAL-BUILT UNMOUNDED STORE WITH NO  
DETONATOR ANNEX ATTACHED

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
<i>Quantity of explosives (kg)</i>	<i>Low density distance (m)</i>	<i>High density distance (m)</i>	<i>Vulnerable building distance (m)</i>	<i>Reference zone radius</i>	<i>Maximum number of dwellings in reference zone</i>
0.1 – 10	23	30	40	46	3
10 – 20	29	35	42	57	4
20 – 30	33	39	44	65	5
30 – 40	36	42	46	71	6
40 – 50	38	44	48	76	7
50 – 60	40	46	48	80	8
60 – 70	42	48	52	84	9
70 – 80	43	50	57	87	9
80 – 90	44	52	61	89	10
90 – 100	45	55	66	91	10
100 – 110	46	57	70	93	11
110 – 120	47	59	74	95	11
120 – 130	48	62	78	97	12
130 – 140	49	64	82	98	12
140 – 150	50	66	86	100	12
150 – 160	51	68	90	102	13
160 – 170	52	71	93	104	13
170 – 180	53	73	97	106	14
180 – 190	54	75	101	108	14
190 – 200	55	78	104	110	15
200 – 300	68	101	136	136	23
300 – 400	83	124	165	165	34
400 – 450	89	135	178	178	39
450 – 500	96	138	191	191	45
500 – 600	108	144	216	216	57
600 – 700	119	150	238	238	70
700 – 800	130	156	260	260	83
800 – 900	140	162	280	280	97
900 – 1000	150	168	300	300	111
1000 – 1100	159	168	319	318	111
1100 – 1200	168	-	337	-	-
1200 – 1300	177	-	354	-	-
1300 – 1400	185	-	370	-	-
1400 – 1500	193	-	386	-	-
1500 – 1600	201	-	402	-	-
1600 – 1700	208	-	416	-	-
1700 – 1800	215	-	431	-	-
1800 – 1900	222	-	444	-	-
1900 – 2000	229	-	458	-	-

**TABLE 5****HAZARD TYPE 1 EXPLOSIVE IN A METAL-BUILT UNMOUNDED STORE WITH A  
DETONATOR ANNEX ATTACHED**

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
<i>Quantity of explosives (kg)</i>	<i>Low density distance (m)</i>	<i>High density distance (m)</i>	<i>Vulnerable building distance (m)</i>	<i>Reference zone radius (m)</i>	<i>Maximum number of dwellings in reference zone</i>
0.1 – 25	38	53	54	74	11
25 – 50	43	53	54	86	11
50 – 75	48	60	54	96	11
75 – 100	53	77	66	106	14
100 – 150	63	110	86	127	20
150 – 200	74	143	104	147	27
200 – 300	94	209	136	188	44
300 – 400	115	275	165	229	65
400 – 450	125	308	178	250	77
450 – 500	128	309	191	257	81
500 – 600	135	311	216	270	90
600 – 700	142	312	238	283	99
700 – 800	148	314	260	297	109
800 – 900	155	316	280	310	119
900 – 1000	162	318	300	324	129
1000 – 1100	169	319	319	337	140
1100 – 1200	175	321	337	350	152
1200 – 1300	182	323	354	364	163
1300 – 1400	189	325	370	377	176
1400 - 1500	195	326	386	391	188
1500 – 1600	202	328	402	404	202
1600 – 1700	209	330	416	417	215
1700 – 1800	215	332	431	431	229
1800 – 1900	222	333	444	444	244
1900 – 2000	229	335	458	458	259



**TABLE 6**HAZARD TYPE 2 EXPLOSIVES, SOME OR ALL ITEMS BEING OF MORE THAN 0.7 KG  
NET MASS

<i>1</i> <i>Quantity of explosives (kg)</i>	<i>2</i> <i>Low density distance (m)</i>	<i>3</i> <i>Vulnerable building distance (m)</i>
0.1 – 25	45	90
25 – 50	88	176
50 – 75	108	216
75 – 100	129	238
100 – 150	148	296
150 – 200	168	336
200 – 300	191	382
300 – 400	207	414
400 – 450	213	426
450 – 500	219	438
500 – 600	226	452
600 – 700	233	466
700 – 800	240	480
800 – 900	248	496
900 – 1000	256	512
1000 – 1100	259	518
1100 – 1200	262	524
1200 – 1300	266	532
1300 – 1400	270	540
1400 – 1500	274	548
1500 – 1600	278	556
1600 – 1700	282	564
1700 – 1800	286	572
1800 – 1900	288	576
1900 – 2000	292	592

**TABLE 7**

HAZARD TYPE 2 EXPLOSIVES, EVERY ITEM BEING OF NOT MORE THAN 0.7 KG NET MASS

<i>1</i>	<i>2</i>	<i>3</i>
<i>Quantity of explosives (kg)</i>	<i>Low density distance (m)</i>	<i>Vulnerable building distance (m)</i>
0.1 – 25	37	76
25 – 50	43	86
50 – 75	47	94
75 – 100	51	102
100 – 150	56	112
150 – 200	60	120
200 – 300	66	132
300 – 400	71	142
400 – 450	73	146
450 – 500	74	148
500 – 600	76	152
600 – 700	78	158
700 – 800	81	162
800 – 900	84	164
900 – 1000	87	174
1000 – 1100	88	176
1100 – 1200	89	178
1200 – 1300	90	180
1300 – 1400	91	182
1400 – 1500	92	184
1500 – 1600	94	188
1600 – 1700	95	190
1700 – 1800	97	194
1800 – 1900	99	198
1900 – 2000	101	202

**TABLE 8**  
HAZARD TYPE 3 EXPLOSIVES

<i>I</i>	<i>2</i>
<i>Quantity of explosives (kg)</i>	<i>Low density distance (m)</i>
0.1 – 25	-
25 – 50	23
50 – 75	25
75 – 100	29
100 – 150	33
150 – 200	37
200 – 300	42
300 – 400	47
400 – 450	47
450 – 500	50
500 – 600	51
600 – 700	53
700 – 800	54
800 – 900	55
900 – 1000	63
1000 – 1100	70
1100 – 1200	71
1200 – 1300	72
1300 – 1400	73
1400 – 1500	74
1500 – 1600	75
1600 – 1700	76
1700 – 1800	78
1800 – 1900	79
1900 – 2000	80

**TABLE 9**  
HAZARD TYPE 4 EXPLOSIVES

<i>I</i>	<i>2</i>
<i>Quantity of explosives (kg)</i>	<i>Low density distance (m)</i>
0.1 – 250	0
250 – 300	1
300 – 340	2
340 – 370	3
370 – 400	4
400 – 450	5
450 – 500	6
500 – 550	7
550 – 600	8
600 – 650	9
650 – 700	10
700 – 750	11
750 – 800	12
800 – 900	13
900 – 950	14
950 – 1000	15
1000 – 1100	16
1100 – 1150	17
1150 – 1200	18
1200 – 1300	19
1300 – 1350	20
1350 – 1400	21
1400 – 1450	22
1450 – 1550	23
1550 – 1600	24
1600 – 1650	25
1650 – 1700	26
1700 – 1800	27
1800 – 1850	28
1850 – 1900	29
1900 – 2000	30

## **Guidance**

595. For guidance on the operation of these tables see the guidance given on regulation 5. In certain cases, the tables in Schedule 2 also specify distances for high population density areas. These tables specify the maximum number of houses (or other dwellings such as flats) which may be in a specified area around the store before the higher distances apply. If no figure is given in the column marked 'High-density distance' it means that there is no high-density distance and the low-density distance applies. In these cases the tables do not specify a reference zone or a maximum number of dwellings.

### SCHEDULE 3

Regulation 11(6)

#### AMOUNT OF PYROTECHNIC ARTICLES WHICH MAY BE KEPT IN SALES AREAS IN RELATION TO REGISTRATION

1. The maximum quantity of pyrotechnic articles which may be kept for any period of time in a sales area at a site in relation to which a person is registered for the storage of explosives shall be the amount specified in column 2 of the Table below corresponding to the floor area of the sales area shown in column 1 of the Table.

<i>1</i> <i>Floor area of sales area</i> <i>(square metres)</i>	<i>2</i> <i>Quantity of explosives</i> <i>(kg)</i>
not exceeding 20	10
not exceeding 40	15
not exceeding 60	20
not exceeding 80	25
not exceeding 100	30
not exceeding 150	35
not exceeding 200	40
not exceeding 250	45
not exceeding 300	50
not exceeding 350	55
not exceeding 400	60
not exceeding 450	65
not exceeding 499	70
equal to or exceeding 500	75

## REGISTERS

1. The licensing authority shall maintain a register (“the register”) containing the information listed in paragraph 2 which relates to licences and registrations granted or made by it.

2. The following information shall be included in the register —

- (a) the name of the licensee or, as the case may be, the person registered under regulation 11;
- (b) his permanent address, unless his home address is his only permanent address;
- (c) the address of the site where the explosives are manufactured or stored (where that differs from any address included pursuant to sub-paragraph (b));
- (d) the hazard type and maximum amount of explosive which may be stored at any one time;
- (e) the nature of the business of the licensee or the person registered under regulation 11 and the intended use of the explosives;
- (f) the kind of explosives manufactured or stored;
- (g) a plan in a suitable scale sufficient to show the separation distances required by regulation 5 or a condition of the licence to be maintained around the store or the building where explosives are manufactured;
- (h) a map in a suitable scale sufficient to show the location of any stores; and
- (i) the kind of store concerned, including the material out of which it is constructed.

3. Subject to paragraph 7, where the licence or registration relates to explosives which do not require an explosives certificate under the Control of Explosives Regulations 1991, the licensing authority shall —

- (a) ensure that the information referred to in paragraph 2(a) to (d) in respect of that licence or registration is available for inspection at an office of the licensing authority, at all reasonable times and free of charge, by members of the public; and
- (b) provide a copy of the entry in the register relating to the information referred to in paragraph 2(a) to (d) in respect of that licence or registration to a member of the public who requests a copy and pays a charge which shall not exceed the reasonable cost of providing the copy.

4. Subject to paragraph 7, where the licence or registration relates to explosives which require an explosives certificate under the Control of Explosives Regulations 1991, the licensing authority shall —

- (a) ensure that the information referred to in paragraph 2(a) to (d) in respect of that licence or registration is available for inspection at an office of the licensing authority, at all reasonable times and free of charge, only by a person who resides or, in the case of an undertaking, is situated within a public consultation zone concerned in relation to the licence or registration; and
- (b) provide a copy of the entry in the register relating to the information referred to in subparagraph 2(a) to (d) in respect of that licence or registration only to such a person as is referred to in subparagraph (a) who requests a copy and pays a charge which shall not exceed the reasonable cost of providing the copy.

5. The register may be kept in any form, including electronically.

6. The licensee or the person registered under regulation 11 in relation to any site in which explosives are manufactured or stored, shall, where requested in writing to do so by the owner or, if not the same person, the occupier, of any premises falling within any separation distance applying in relation to that site, provide to the requesting person within twenty-eight days of the request a scale plan of the area of land falling within that separation distance.

7. The requirements of paragraphs 3 and 4 shall not apply where the information referred to in paragraph 2 is in respect of any site to which a licence or registration relates which is used only for the storage of—

- (a) less than 500 kilograms of hazard type 1 explosive or hazard type 2 explosive;
- (b) less than 2 tonnes of hazard type 3 explosive or hazard type 4 explosive; or
- (c) any explosives for a period of less than four weeks.

8. Where the licensing authority is a local authority, that licensing authority shall notify the Executive in writing, within twenty-eight days of receipt of a written request by the Executive to do so, as to such information as is contained in the register it maintains relating to the information referred to in paragraph 2 as the Executive may require for any of the general purposes of Part 1 of the 1974 Act.

9. Nothing in this Schedule shall prevent a licensing authority from disclosing any of the information included in the register it maintains to a local planning authority or a joint planning board for the purposes of the exercise of their respective functions.

For the purposes of paragraph 9, “local planning authority” and “joint planning board” have the meanings they are given in, respectively, sections 1 and 2 of the Town and Country Planning Act 1990<sup>(a)</sup>.

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<sup>(a)</sup> 1990 c.8. Section 1 is amended by the Leasehold Reform, Housing and Urban Development Act 1993 (c.28), section 187(1) and Schedule 21, paragraph 28, the Local Government Wales Act 1994 (c.19) sections 18(2) – (6), 66(8) and Schedule 18 and the Environment Act 1995 (c.25), sections 78 and 120(3) and Schedule 10, paragraph 32(1) and Schedule 24. Section 2 is amended by the Local Government (Wales) Act 1994, sections 19(1), (4) and 66(8) and Schedule 18 and the Environment Act 1995, sections 78, 120(1) and (3) and Schedule 10, paragraph 32(2) and Schedule 22, paragraph 42, and Schedule 24.



## AMENDMENTS

## PART 1

## AMENDMENTS TO PRIMARY LEGISLATION

**Explosives Act 1875**

**10.**—(1) The 1875 Act is amended as follows.

(2) Omit sections 4 to 22 and for section 23 (precautions against fire or explosion to be taken by occupier) substitute —

**“ 23. Precautions against unauthorised access**

(1) The occupier of every premises at which gunpowder is manufactured or stored shall take all due precaution for preventing unauthorised persons having access to the premises or to the gunpowder therein.

(2) In the event of any breach (by any act or default) of subsection (1), the occupier shall be guilty of an offence.

(3) In this section, “premises” has the meaning given in section 53 of the Health and Safety at Work etc. Act 1974.”.

(3) Omit sections 24 to 29, 35, 36, 38, 40 and 41.

(4) In section 43 (power to prohibit, manufacture, importation, storage and carriage of specially dangerous explosives) —

(a) omit “, either absolutely, or except in pursuance of a license of the Health and Safety Executive under this Act”; and

(b) for the words from “Provided that” to “conveyance of explosives” substitute “A person who manufactures, keeps or conveys any explosive in contravention of any such Order shall be guilty of an offence and liable to the penalties specified in section 33(3) of the Health and Safety at Work etc. Act 1974.”.

(5) Omit sections 44 to 51, 58, 60, 63 and 64.

(6) In section 67 (definition of local authority) —

(a) in paragraph (1), omit “except as hereafter in this section mentioned,”;

(b) after paragraph (1), insert —

“(1A) In a London borough, the council of the borough; and”;

(c) omit paragraph (4) and the word “and” preceding it.

(7) Omit sections 70 to 72, 77, 78 and 82.

(8) In section 83 (provisions as to Orders in Council and orders of the Secretary of State), omit —

(a) “, and a Secretary of State may by order,”;

(b) “or orders of the Secretary of State, as the case may be,”; and

(c) the words from “The provisions of section 50” to the end of the section.

(9) Omit sections 84 and 86.

(10) In section 91 (prosecution of offences either summarily or on indictment), omit the words from “Provided that” to “exceed one month”.

(11) In section 97 (exemption of Government factories, etc, from the Act), omit paragraphs (3) and (4) and the words from “Provided that” to the end of the section.

(12) Omit sections 98 and 101.

(13) In section 102 (saving clause as to liability), omit the words from “A continuing certificate” to the end of the section.

- (14) Omit sections 103, 105 and 106.
- (15) In section 108 (general definitions) —
- (a) in the definition of “this Act”, omit “certificate, byelaw, regulation, rule,”;
  - (b) in the definition of “store”, omit “an existing gunpowder store as defined by this Act, or” and “licensed by a license granted by a local authority under this Act”; and
  - (c) omit the definitions of “existing”, “factory magazine”, “harbour authority”, “canal company”, “railway company”, “safety cartridges” and “Gunpowder Act 1860”.
- (16) In section 109 (definitions in relation to application of Act to Scotland), omit paragraph (11).
- (17) In section 110 (local authority), omit paragraph 2 and the word “and” preceding it.
- (18) In section 111 (expenses of local authority), omit paragraph (b) and the word “and” preceding it.
- (19) Omit section 113.
- (20) In section 114 (provision for making and enforcing byelaws, &c in relation to Scotland), omit paragraph (a).
- (21) Omit Schedule 1.

### **Celluloid and Cinematograph Film Act 1922**

**11.** In section 9 of the Celluloid and Cinematograph Film Act 1922<sup>(a)</sup> (definitions), in the definition of “celluloid”, for “Explosives Act 1875” substitute “Manufacture and Storage of Explosives Regulations 2004”.

### **Explosives Act 1923**

**12.** The Explosives Act 1923<sup>(b)</sup> is repealed.

### **London Building Act 1930**

**13.** In section 143(4)(a) of the London Building Act 1930<sup>(c)</sup> (regulations for building near dangerous business), for “the Explosives Act 1875” substitute “the Manufacture and Storage of Explosives Regulations 2004”.

### **Acquisition of Land (Authorisation Procedure) Act 1946**

**14.** In Schedule 4 to the Acquisition of Land (Authorisation Procedure) Act 1946<sup>(d)</sup> (minor and consequential amendments), omit the entry relating to the Explosives Act 1875.

### **National Parks and Access to the Countryside Act 1949**

**15.** In section 80 of the National Parks and Access to the Countryside Act 1949<sup>(e)</sup> (provisions as to danger areas), omit subsections (5) and (6).

### **Fireworks Act 1951**

**16.**—(1) The Fireworks Act 1951<sup>(f)</sup> is amended as follows.

(2) In section 1 (destruction of dangerous fireworks), in subsections (1) and (2), omit “, magazine” in each place where it occurs.

(3) In section 2 (determination or amendment of licence for a factory where dangerous fireworks are made) —

- (a) in subsection (2), for “the principal Act” substitute “the 2004 Regulations”;
- (b) in subsection (3) —

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<sup>(a)</sup> 1922 c.35.

<sup>(b)</sup> 1923 c. 17.

<sup>(c)</sup> 1930 c. clviii.

<sup>(d)</sup> 1946 c. 49 (9 & 10 Geo. 6.).

<sup>(e)</sup> 1949 c.97.

<sup>(f)</sup> 1951 c.58 (14 & 15 Geo.6); amended by the Criminal Justice Act 1982 (c. 48), sections 38, 40 and 46, and S.I.1974/1885. Sections 1, 2, 5 and 9 are modified by virtue of section 80(1) of the 1974 Act. Sections 4 and 7 are “existing statutory provisions” within the meaning of section 53 of the 1974 Act and are repealed by virtue of section 15(3)(a) of that Act.

- (i) for “the principal Act” where these words first appear, substitute “the 2004 Regulations” and where they appear for the second time, substitute “those Regulations”;
  - (ii) for “that Act”, substitute “those Regulations”; and
  - (iii) for the proviso, substitute “Despite the determination of the licence, no proceedings shall be taken for breach of regulation 10 of the 2004 Regulations in respect of fireworks kept at the factory in question in pursuance of a requirement of an inspector under section 1 of this Act.”;
  - (c) in subsection (4), for “the principal Act” in each place substitute “the 2004 Regulations”; and
  - (d) omit subsection (6).
- (4) Omit section 4 (determination or amendment of licences for factory where there is negligent manufacture).
- (5) In section 5 (marking of fireworks) —
- (a) omit subsection (5); and
  - (b) in subsection (8), for “a government inspector for the purposes of the principal Act” substitute “an inspector appointed by the Health and Safety Executive under section 19 of the Health and Safety at Work etc. Act 1974”.
- (6) Omit section 7 (small firework factory licences).
- (7) For section 9 (interpretation) substitute —

#### **“9. Interpretation**

In this Act —

“the 2004 Regulations” means the Manufacture and Storage of Explosives Regulations 2004;

“explosives” has the same meaning as in the Explosives Act 1875;

“factory” means any place at which explosives are manufactured under a licence granted under regulation 13 of the 2004 Regulations;

“occupier”, in the case of any manufacture, includes any person carrying on such manufacture; and

“store” means any place at which explosives are stored —

- (a) by a person registered under regulation 11 of the 2004 Regulations 2004, or
- (b) under a licence granted under regulation 13 of those Regulations.”.

#### **Emergency Laws (Miscellaneous Provisions) Act 1953**

- 17.**—(1) The Emergency Laws (Miscellaneous Provisions) Act 1953<sup>(a)</sup> is amended as follows.
- (2) Section 3 (extension of control of certain explosives) is omitted.
  - (3) In section 12(3) (provisions as to orders), omit “three or”.
  - (4) In section 13 (application to Northern Ireland), omit “three”.

#### **London Government Act 1963**

**18.** In section 50 of the London Government Act 1963<sup>(b)</sup> (explosives and petroleum spirit), omit subsections (1) and (3).

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<sup>(a)</sup> 1953 c. 47. Section 12 is modified by virtue of section 80(1) of the 1974 Act. Section 3 is an “existing statutory provision” within the meaning of section 53 of the 1974 Act and is modified by virtue of section 15(3)(a) of that Act.

<sup>(b)</sup> 1963 c. 33.

### **Trade Descriptions Act 1968**

19. In section 32(2) of the Trade Descriptions Act 1968<sup>(a)</sup> (power to exempt goods sold for export, etc), for “Explosives Acts 1875 and 1923” substitute “Manufacture and Storage of Explosives Regulations 2004”.

### **Public Expenditure and Receipts Act 1968**

20. In Schedule 3 to the Public Expenditure and Receipts Act 1968<sup>(b)</sup> (variation of fees, etc.), omit entry number 4 (relating to the Explosives Act 1875).

### **Fire Precautions Act 1971**

21. In Schedule 2 to the Fire Precautions Act 1971<sup>(c)</sup> (which modifies the Act in relation to certain premises), in paragraph 7, for “the Explosives Act 1875” substitute “the Manufacture and Storage of Explosives Regulations 2004”.

### **Health and Safety at Work etc Act 1974**

22. In Schedule 1 to the Health and Safety at Work etc Act 1974<sup>(d)</sup> (existing enactments which are relevant statutory provisions), omit the entries relating to the Explosives Act 1923, the Fireworks Act 1951 and the Emergency Laws (Miscellaneous Provisions) Act 1953.

### **Control of Pollution Act 1974**

23. Until the coming into force of its repeal by the Environmental Protection Act 1990<sup>(e)</sup> the definition of “waste” in section 30 of the Control of Pollution Act 1974<sup>(f)</sup> has effect as if the reference to the Explosives Act 1875 were a reference to these Regulations.

### **Customs and Excise Management Act 1979**

24. In section 75(1) of the Customs and Excise Management Act 1979<sup>(g)</sup> (meaning of “explosive”), for “the Explosives Act 1875” substitute “the Manufacture and Storage of Explosives Regulations 2004”.

### **Isle of Man Act 1979**

25.—(1) Section 8(2) of the Isle of Man Act 1979<sup>(h)</sup> (removal of goods to the United Kingdom) is amended as follows.

- (2) in sub-paragraph (b), omit the final “or”;
- (3) at the end of sub-paragraph (c), insert “or”; and
- (4) after sub-paragraph (c) insert —

“(d) any explosives the importation of which into the United Kingdom is prohibited by regulation 24 of the Manufacture and Storage of Explosives Regulations 2004.”

### **Roads (Scotland) Act 1984**

26. In paragraph 7 of Schedule 9 to the Roads (Scotland) Act 1984<sup>(i)</sup> (minor and consequential amendments), omit sub-paragraph (2).

### **Environmental Protection Act 1990**

27.—(1) The Environmental Protection Act 1990<sup>(j)</sup> shall be amended as follows.

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<sup>(a)</sup> 1968 c.29; subsection (2) was inserted by the Weights and Measures Act 1985 (c. 72), section 97, Schedule 12, paragraph 4(2).

<sup>(b)</sup> 1968 c. 14.

<sup>(c)</sup> 1971 c. 40. Schedule 2 was inserted by section 16(2) of and Schedule 1 to the Fire Safety and Safety of Places of Sport Act 1987 c. 27.

<sup>(d)</sup> 1974 c. 37.

<sup>(e)</sup> 1990 c. 43. Section 30 of the Control of Pollution Act 1974 is prospectively repealed by Schedule 16 of the Environmental Protection Act 1990.

<sup>(f)</sup> 1974 c. 40.

<sup>(g)</sup> 1979 c. 2.

<sup>(h)</sup> 1979 c. 58.

<sup>(i)</sup> 1984 c. 54.

<sup>(j)</sup> 1990 c. 43.

(2) In section 75(2) (meaning of waste) as enacted, for “the Explosives Act 1875” substitute “the Manufacture and Storage of Explosives Regulations 2004”.

(3) In section 142(7) (powers to obtain information), for “the Explosive Substances Act 1875” substitute “the Manufacture and Storage of Explosives Regulations 2004”.

#### **Merchant Shipping Act 1995**

28. In Schedule 13 of the Merchant Shipping Act 1995<sup>(a)</sup> (consequential amendments), omit paragraph 5.

#### **Criminal Procedure (Scotland) Act 1995**

29. In Schedule 5 to the Criminal Procedure (Scotland) Act 1995<sup>(b)</sup>, omit the entries for the forms of complaint relating to —

- (a) the Explosives Act 1875, section 5; and
- (b) the Explosives Act 1875, section 22 and section 3, subsection (1), Mode B, of the Order in Council dated 26th October 1896.

## **PART 2**

### **AMENDMENTS TO SECONDARY LEGISLATION**

#### **The Factory and Workshop Act 1901, use of locomotives and wagons on lines and sidings, Regulations 1906**

30. In regulation 3 of the Factory and Workshop Act 1901, use of locomotives and wagons on line and sidings, Regulations 1906<sup>(c)</sup> (examination and maintenance of lines or rails and points), for “Explosives factories or workshops within the meaning of the Explosives Act 1875” substitute “Any site for the manufacture of explosives which is specified in a licence granted under the Manufacture and Storage of Explosives Regulations 2004”.

#### **Order in Council No. 30 dated 2nd February 1937**

31. After the proviso in Order in Council No. 30 dated 2nd February 1937<sup>(d)</sup>, insert —

“For the purposes of paragraph (1) of the proviso, all buildings and places adjoining each other and occupied together shall be deemed to be the same premises.”.

#### **The Stratified Ironstone, Shale and Fireclay Mines (Explosives) Regulations 1956**

32. In regulation 5 of Part III of the Stratified Ironstone, Shale and Fireclay Mines (Explosives) Regulations 1956<sup>(e)</sup> (storage, issue and conveyance of explosives and detonators), for the words from “workshop” to the end, substitute “suitable place appointed for that purpose by the manager of the mine”.

#### **The Miscellaneous Mines (Explosives) Regulations 1959**

33. In regulation 34 of Part VII of Miscellaneous Mines (Explosives) Regulations 1959<sup>(f)</sup> (shot-firing – additional provisions for shafts, winzes and raises), for the words from “workshop used” to the end substitute “suitable place for that purpose appointed by the manager of the mine”.

#### **The Clean Air (Emission of Dark Smoke)(Exemption) Regulations 1969**

34. In paragraph 2 of Schedule 1 to the Clean Air (Emission of Dark Smoke)(Exemption) Regulations 1969<sup>(g)</sup> (exempted matter), for “the Explosives Act 1875” substitute “the Manufacture and Storage of Explosives Regulations 2004”.

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<sup>(a)</sup> 1995 c. 21.

<sup>(b)</sup> 1995 c.46.

<sup>(c)</sup> S.R. & O. 1906/679.

<sup>(d)</sup> S.R. & O. 1937/54, amended by S.R & O. 1947/805 and S.I. 1978/1723.

<sup>(e)</sup> S.I. 1956/1943, to which there are amendments not relevant to these Regulations.

<sup>(f)</sup> S.I. 1959/2258, to which there are amendments not relevant to these Regulations.

<sup>(g)</sup> S.I. 1969/1263.

### **The Rehabilitation of Offenders Act 1974 (Exceptions) Order 1975**

**35.**—(1) The Rehabilitation of Offenders Act 1974 (Exceptions) Order 1975<sup>(a)</sup> is amended as follows.

(2) In paragraph 8 of Part III of Schedule 1 (excepted professions, offices, employments, work and occupations), for the words from “by any Order in Council” to the end substitute “pursuant to regulations 4 and 7 of the Control of Explosives Regulations 1991 to obtain from the chief officer of police a valid explosives certificate certifying him to be a fit person to keep explosives”.

(3) For paragraph 3 of Schedule 2 (excepted licences, certificates and permits), substitute “Explosives certificates issued by a chief officer of police pursuant to regulations 4 and 7 of the Control of Explosives Regulations 1991 as to the fitness of a person to keep explosives”.

(4) In paragraph 13 of Schedule 3 (excepted proceedings), for the words from “police or” to the end substitute “chief officer of police for an explosives certificate pursuant to regulations 4 and 7 of the Control of Explosives Regulations 1991 as to the fitness of the applicant to keep explosives”.

### **The Fire Certificates (Special Premises) Regulations 1976**

**36.** For paragraph 10 of Part I of Schedule 1 to the Fire Certificates (Special Premises) Regulations 1976<sup>(b)</sup> (designation of certain premises), substitute —

“**10.** Any site where explosives are stored under a licence granted by the Executive under the Manufacture and Storage of Explosives Regulations 2004 where the Executive is the licensing authority by virtue of paragraph 1(c) of Schedule 1 to those Regulations.”.

### **The Isle of Scilly (Functions) Order 1979**

**37.** In article 3(e) of the Isles of Scilly (Functions) Order 1979<sup>(c)</sup> (functions), for “the Explosives Act 1923” substitute “the Manufacture and Storage of Explosives Regulations 2004”.

### **The Notification of Installations Handling Hazardous Substances Regulations 1982**

**38.** In the entry for ammonium nitrate in column 1 of Part I of Schedule 1 to the Notification of Installations Handling Hazardous Substances Regulations 1982<sup>(d)</sup> (named substances), for “the Explosives Act 1875” substitute “the Manufacture and Storage of Explosives Regulations 2004”.

### **The Classification and Labelling of Explosives Regulations 1983**

**39.**—(1) The Classification and Labelling of Explosives Regulations 1983<sup>(e)</sup> are amended as follows.

(2) In paragraph (3) of regulation 3 (classification and labelling of explosive articles and explosive substances and of combinations and unit loads thereof), omit “Subject to regulation 11,”.

### **The Dangerous Goods in Harbour Areas Regulations 1987**

**40.** In Part IX of the Dangerous Goods in Harbour Areas Regulations 1987<sup>(f)</sup> (explosives) —

(a) in regulation 33(1)(b), for the words from “article 7” to the end substitute “article 8 of the Health and Safety at Work etc. Act 1974 (Application Outside Great Britain) Order 2001”; and

(b) for regulation 33(2)(e), substitute —

“(e) a berth which forms part of a site —

(i) licensed under the Manufacture and Storage of Explosives Regulations 2004 in cases where, in relation to the application for that licence, the assent of the local authority was required pursuant to regulation 13(3) of those Regulations; or

(ii) which is deemed to be licensed under those Regulations by virtue of regulation 27 of those Regulations in cases where, in relation to that deemed licence, the

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<sup>(a)</sup> S.I. 1975/1023, to which there are amendments not relevant to these Regulations.

<sup>(b)</sup> S.I. 1976/2003.

<sup>(c)</sup> S.I. 1979/72.

<sup>(d)</sup> S.I. 1982/1357.

<sup>(e)</sup> S.I. 1983/1140, to which there are amendments not relevant to these Regulations.

<sup>(f)</sup> S.I. 1987/33, to which there are amendments not relevant to these Regulations.

assent of the local authority would have been required pursuant to regulation 13(3) of those Regulations had the licence been applied for under those Regulations;”.

### **The Building Standards (Scotland) Regulations 1990**

41. In Schedule 1 to the Building Standards (Scotland) Regulations 1990<sup>(a)</sup> (exempted class of building), in relation to class 1, for the description in column (2), substitute —

“A building the construction of which is subject to the Manufacture and Storage of Explosives Regulations 2004”.

### **The Control of Explosives Regulations 1991**

42.—(1) The Control of Explosives Regulations 1991<sup>(b)</sup> are amended as follows.

(2) In regulation 2 (interpretation) —

(a) after the definition of “the 1983 Regulations”, insert —

““the 2004 Regulations” means the Manufacture and Storage of Explosives Regulations 2004;”;

(b) after the definition of “chief officer of police”, insert —

““desensitised explosive” means —

(a) a solid explosive substance which has been wetted with water, alcohol or dissolved with one or more other substances; or

(b) a liquid explosive substance which has been dissolved or suspended in water or one or more other substances,

to form a homogeneous mixture so as to suppress its explosive properties and which, without that treatment, would be classified in accordance with the United Nations Recommendations as falling within Class 1;”

(c) for the definition of “explosive”, substitute —

““explosive” means —

(a) any explosive article or explosive substance which would —

(i) if packaged for transport, be classified in accordance with the United Nations Recommendations as falling within Class 1; or

(ii) be classified in accordance with the United Nations Recommendations as —

(aa) being unduly sensitive or so reactive as to be subject to spontaneous reaction and accordingly too dangerous to transport, and

(ab) falling within Class 1; or

(b) a desensitised explosive,

but it does not include an explosive substance produced as part of a manufacturing process which thereafter reprocesses it in order to produce a substance or preparation which is not an explosive substance;

“explosive article” means an article containing one or more explosive substances;”;

(d) after the definition of “explosives certificate”, insert —

““explosive substance” means a substance or preparation, not including a substance in a gaseous form or in the form of vapour, which is —

(a) capable by chemical reaction in itself of producing a gas at such a temperature and pressure and at such speed as could cause damage to surroundings; or

(b) designed to produce an effect by heat, light, sound, gas or smoke or a combination of these as a result of a non-detonative self-sustaining exothermic chemical reaction;”;

(e) for the definition of “license”, substitute —

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<sup>(a)</sup> S.I. 1990/2179; amended by S.I. 1999/173; there are other amending instruments but none are relevant.

<sup>(b)</sup> S.I. 1991/1531, to which there are amendments not relevant to these Regulations.

- ““licence” means a licence for the manufacture or storage of explosives granted under regulation 13 of the 2004 Regulations;”;
- (f) omit the definitions of “licensed factory”, “licensed magazine”, “percussion caps” and “store”;
- (g) after the definition of “occupier”, insert —  
 ““preparation” means a mixture or a solution of two or more substances;”;
- (h) for the definition of “registered premises” substitute —  
 ““registered”, in relation to a person, means a person registered in respect of the storage of explosives under regulation 11 of the 2004 Regulations and “registration” shall be construed accordingly;”;
- (i) after the definition of “smokeless powder”, insert —  
 ““substance” means any natural or artificial substance whether in solid or liquid form or in the form of a gas or vapour;”;
- (j) after the definition of “U.N. no.”, insert at the end “and  
 “United Nations Recommendations” means the United Nations Recommendations on the Transport of Dangerous Goods (based on those originally prepared by the United Nations Committee of Experts on the Transport of Dangerous Goods considered by the Economic and Social Committee of Experts at its twenty-third session (Resolution 645G (XXIII) of 26 April 1957)) as revised or reissued from time to time.”.
- (3) In paragraphs (3) and (4) of regulation 3 (application), for “Regulations 7 and 10”, substitute “Regulation 7”.
- (4) In regulation 4 (explosives certificate) —
- (a) in paragraph 6(b) and (c), omit “subject to paragraph (7)”;
- (b) for paragraph 6(f) and (g), substitute —  
 “(f) where the application is for a certificate relating only to acquisition of explosives —  
 (i) it is not reasonably practicable for the applicant to be an occupier of a site for the storage of explosives for which he would be required under the 2004 Regulations to have a licence or be registered in respect of that storage, and  
 (ii) the explosives either will not be kept, or, if kept, the applicant will ensure that they are kept at a site where such storage is permitted pursuant to a licence or registration or at a site occupied by the Secretary of State for Defence; and  
 (g) where the application is for a certificate relating to the keeping of explosives, either —  
 (i) the applicant is or is to be the occupier of a site for the storage of explosives in respect of which storage there is or will be a licence or registration in force; or  
 (ii) the explosives will be kept at a site occupied on behalf of the Crown, or  
 (iii) in the case where the applicant does not hold a licence in respect of the storage of the explosives, no licence is required to be held by the applicant in respect of that storage by virtue of regulation 10(2) of the 2004 Regulations.”;
- (c) paragraph (7) is revoked.
- (5) At the end of regulation 8(e), insert —  
 “and that, where those provisions apply to a specified person only in particular circumstances or for particular purposes, those circumstances or purposes are satisfied in the case of the person concerned.”.
- (6) For paragraph (2) of regulation 9 (restrictions on prohibited persons), substitute —  
 “(2) No prohibited person, whether or not he satisfies any relevant conditions of regulation 7, shall acquire, handle or have control of any explosive or any restricted substance.”.
- (7) Regulation 10 (keeping explosives for private use) is revoked.
- (8) For regulation 11 (occupier of licensed factory of licensed magazine to appoint person responsible for explosives), substitute —



**“Licensed occupier to appoint person responsible for security of explosives**

11.—(1) An person who occupies a site and who has —

- (a) a licence for the manufacture or storage of explosives at that site which was granted by the Executive in a case where the assent of the local authority was required pursuant to regulation 13(3) of the 2004 Regulations; or
- (b) a deemed licence which, if an application for a licence would have been made under the 2004 Regulations in respect of the manufacture or storage of explosives to which the deemed licence relates, that application would have required the assent of the local authority pursuant to regulation 13(3) of those Regulations shall appoint one individual to be responsible to him for ensuring that adequate precautions are taken at that site to secure explosives against loss.

(2) For the purposes of paragraph (1) —

“deemed licence” means a licence, amending licence, continuing certificate or store licence granted or issued under sections 8, 12, 14 or 15 of the Explosives Act 1875 which is deemed by virtue of regulation 27(1) of the 2004 Regulations to be a licence granted under regulation 13 of those Regulations.”

(9) In regulation 12 (making, preservation and production of records) —

(a) for paragraph (4)(c), substitute —

“(c) an explosive which is produced by mixing at any place non-explosive substances or preparations to form an explosive for immediate use at that place.”; and

(b) in paragraph (4)(a), omit “for private use”.

(10) In paragraph (8) of regulation 13 (reporting loss), for “licensed factory or licensed magazine” substitute “site in relation to which the Executive is the licensing authority by virtue of Schedule 1 to the 2004 Regulations,”.

(11) Regulations 16 (power to revoke or amend licences) and 18 (transitional provisions) and paragraphs (5) and (6) of regulation 19 (modifications, revocations and savings) are revoked.

(12) For Schedule 1 (exceptions) substitute —

(a)

“

**SCHEDULE 1  
EXCEPTIONS**

Regulation 3

<i>Explosives</i>	<i>U.N. no.</i>
2 AMINO – 4, 6 – DINITROPHENOL, WETTED with not less than 20% water by mass	3317
AMMONIUM PICRATE, WETTED with not less than 10% water by mass	1310
ARTICLES, PYROTECHNIC for technical purposes	0428
Table text*	Table text
Table text*	Table text
Table text*	Table text
Table text*	Table text
Table text*	Table text
Table text*	Table text
Table text*	Table text
Table text*	Table text
Table text*	Table text
Table text*	Table text





3. The only explosives which may be acquired are those of the following descriptions, namely.....

4. Explosives may only be acquired for the purpose(s) of .....

5. This certificate shall be valid until .....(maximum one year), unless notice of revocation by or on behalf of the chief officer of police has been served on the certificate holder at an earlier date.

(Notes:

- (a) If this certificate relates to acquisition only, this section must be completed in accordance with these Notes and “alternative B” deleted.
- (b) Each of paragraphs 2, 3 and 4 may be completed or deleted.
- (c) Paragraph 5 must be completed.)

**Alternative B – acquisition and keeping**

2. The explosives may only be kept at the following address(es), namely, at .....

3. The only explosives which may be acquired or kept are those of the following descriptions, namely.....

4. The amount of explosives kept may not exceed the amount which may lawfully be kept at the said address(es).

5. This certificate shall be valid until .....(maximum three years), unless notice of revocation by or on behalf of the chief officer of police has been served on the certificate holder at an earlier date.

(Notes:

- (a) If this certificate relates to acquisition and keeping, this section must be completed in accordance with these Notes and “Alternative A” deleted.
- (b) In paragraph 2, no address should be inserted if the explosives are to be kept at premises used for keeping for private use. An address must otherwise be inserted.
- (c) Paragraph 4 needs no change.
- (d) Paragraph 5 must be completed.)

Signed .....

Date .....

\* Delete as applicable ”

**The Planning (Hazardous Substances) Regulations 1992**

43.—(1) Schedule 1 to the Planning (Hazardous Substances) Regulations 1992<sup>(a)</sup> (hazardous substances and controlled quantities) is amended as follows.

(2) For paragraph 50(1) of Part A (named substances), substitute —

“(1) cellulose nitrate for which a licence, granted by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2004 (where the Health and Safety Executive is the licensing authority by virtue of paragraph 1(c) of Schedule 1 to those Regulations), is required; or”.

(3) In paragraphs 4 and 5 of Part B (categories of substances and preparations not specifically named in Part A), for the words from “excluding those” to the end of each paragraph substitute —

<sup>(a)</sup> S.I. 1992/656, amended by S.I. 1999/981; there are other amending instruments but none is relevant.

“excluding those for which a licence, granted by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2004 (where the Health and Safety Executive is the licensing authority by virtue of paragraph 1(c) of Schedule 1 to those Regulations), is required or those licensed under the Dangerous Substances in Harbour Areas Regulations 1987”.

#### **The Town and Country Planning (Hazardous Substances) (Scotland) Regulations 1993**

**44.**—(1) Schedule 1 to the Town and Country Planning (Hazardous Substances) (Scotland) Regulations 1993<sup>(a)</sup> (hazardous substances and controlled quantities) is amended as follows.

(2) For paragraph 50(1) of Part A (named substances), substitute —

“(1) cellulose nitrate for which a licence, granted by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2004 (where the Health and Safety Executive is the licensing authority by virtue of paragraph 1(c) of Schedule 1 to those Regulations), is required; or”.

(3) In paragraphs 4 and 5 of Part B (categories of substances and preparations not specifically named in Part A), for the words from “excluding those” to the end of each paragraph substitute —

“excluding those for which a licence, granted by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2004 (where the Health and Safety Executive is the licensing authority by virtue of paragraph 1(c) of Schedule 1 to those Regulations), is required or those licensed under the Dangerous Substances in Harbour Areas Regulations 1987”.

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

**45.** For the definition of “explosives store” in regulation 2(1) of the Coal and Other Safety-Lamp Mines (Explosives) Regulations 1993<sup>(b)</sup> (interpretation etc of Part 1), substitute —

““explosives store” means a building, enclosed area or metal structure where explosives are stored under a licence granted or registration made under the Manufacture and Storage of Explosives Regulations 2004;”.

#### **The Placing on the Market and Transfer of Explosives Regulations 1993**

**46.** Regulation 12(1) and Part I of Schedule 4 to the Placing on the Market and Supervision of Transfers of Explosives Regulations 1993<sup>(c)</sup> (modifications to the Explosives Act 1875) are revoked.

#### **The Toys (Safety) Regulations 1995**

**47.** In Schedule 3 to the Toys (Safety) Regulations 1995<sup>(d)</sup>, in the note at the end marked with an asterisk, for “Explosives Act 1875” substitute “Manufacture and Storage of Explosives Regulations 2004”.

#### **The Reporting of Injuries and Dangerous Occurrences Regulations 1995**

**48.**—(1) The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995<sup>(e)</sup> shall be amended as follows.

(2) In Schedule 2 (dangerous occurrences) —

(a) in Part 1 (general) —

(i) for paragraph 6(1)(a), substitute —

“(a) any unintentional fire, explosion or ignition at a site —

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<sup>(a)</sup> S.I. 1993/323, amended by S.S.I. 2000/179; there are other amending instruments but none is relevant.

<sup>(b)</sup> S.I. 1993/208, to which there are amendments not relevant to these Regulations.

<sup>(c)</sup> S.I. 1993/2714.

<sup>(d)</sup> S.I. 1995/204, to which there are amendments not relevant to these Regulations.

<sup>(e)</sup> S.I. 1995/3163, amended by S.I. 1996/2092; there are other amending instruments but none is relevant.

- (i) where explosives are manufactured or stored by a person who is licensed, or who is required to be licensed, in respect of that manufacture or storage under the Manufacture and Storage of Explosives Regulations 2004; or
- (ii) where explosives are stored by a person who is registered, or who is required to be registered, in respect of that storage under those Regulations;
- (aa) the unintentional explosion or ignition of explosives at a place other than a site described in subparagraph (1)(a), not being one —
  - (i) caused by the unintentional discharge of a weapon where, apart from that unintentional discharge, the weapon and explosives functioned as they were designed to do; or
  - (ii) where a fail-safe device or safe system of work functioned so as to prevent any person from being injured in consequence of the explosion or ignition;”;
- (ii) at the end of paragraph 6(1)(e), insert “or from any intentional fire or ignition”: and
- (iii) for paragraph 6(2), substitute —

“(2) In this paragraph —

“danger zone” means the area from which persons have been excluded or forbidden to enter to avoid being endangered by any explosion or ignition of explosives;

“desensitised explosive” means —

- (a) a solid explosive substance which has been wetted with water, alcohol or dissolved with one or more other substances; or
- (b) a liquid explosive substance which has been dissolved or suspended in water or one or more other substances,

to form a homogeneous mixture so as to suppress its explosive properties and which, without that treatment, would be classified in accordance with the United Nations Recommendations as falling within Class 1;

“explosive” means —

- (a) any explosive article or explosive substance which would —
  - (i) if packaged for transport, be classified in accordance with the United Nations Recommendations as falling within Class 1; or
  - (ii) be classified in accordance with the United Nations Recommendations as —
    - (aa) being unduly sensitive or so reactive as to be subject to spontaneous reaction and accordingly too dangerous to transport, and
    - (ab) falling within Class 1; or
- (b) a desensitised explosive,

but it does not include an explosive substance produced as part of a manufacturing process which thereafter reprocesses it in order to produce a substance or preparation which is not an explosive substance;

“explosive article” means an article containing one or more explosive substances;

“explosive substance” means a substance or preparation, not including a substance in a gaseous form or in the form of vapour, which is —

- (a) capable by chemical reaction in itself of producing gas at such a temperature and pressure and at such a speed as could cause damage to surroundings; or
- (b) designed to produce an effect by heat, light, sound, gas or smoke or a combination of these as a result of non-detonative self-sustaining exothermic chemical reactions;

“preparation” means a mixture or a solution of two or more substances; and

“United Nations Recommendations” means the United Nations Recommendations on the Transport of Dangerous goods (based on those originally prepared by the United Nations Committee of Experts on the Transport of Dangerous Goods considered by the Economic and Social Committee of Experts at its twenty-third session (Resolution 645G (XXIII) of 26 April 1957)) as revised or reissued from time to time.”.

(3) In Schedule 7 (enactments or instruments requiring the notification of events which are not required to be notified or reported under the Regulations), omit the entry relating to the Explosives Act 1875.

### **The Health and Safety (Enforcing Authority) Regulations 1998**

**49.** For regulation 4(7) of the Health and Safety (Enforcing Authority) Regulations 1998<sup>(a)</sup> (exceptions), substitute —

“(7) Notwithstanding the preceding provisions of this regulation and subject to paragraphs (8) to (10), a licensing authority shall be the enforcing authority for the Manufacture and Storage of Explosives Regulations 2004 (“the 2004 Regulations”) and section 23 of the Explosives Act 1875 —

(a) for a site in relation to which it has granted a person a licence for the manufacture or storage of explosives at that site under regulation 13 of the 2004 Regulations or registered a person in respect of such storage at that site under regulation 11 of those Regulations;

(b) where, in relation to a deemed licence or deemed registration, it would have been the licensing authority by virtue of paragraph 1 of Schedule 1 to the 2004 Regulations if an application for a licence or registration had been made under those Regulations; and

(c) where, in any other case than those referred to in subparagraphs (a) and (b)—

(i) it would be the licensing authority by virtue of paragraph 1 of Schedule 1 to those Regulations if an application for a licence or registration is, or should have been, made under those Regulations, or

(ii) it would have been the licensing authority had not the requirements of regulation 9(1) or, as the case may be, 10(1) been disapplied by virtue of any of the provisions of, respectively, regulation 9(2) or 10(2) applying,

in the case concerned.

(8) The Executive shall be the enforcing authority for the 2004 Regulations in respect of the manufacture of ammonium nitrate blasting intermediate.

(9) A licensing authority which is a local authority shall be the enforcing authority for regulation 25 of the 2004 Regulations in the area of that local authority.

(10) The enforcing authority for regulation 6 of the 2004 Regulations where any disposal of explosives or decontamination of explosive-contaminated items is carried out at a place other than at a site in relation to which a person has a licence to manufacture or store explosives under regulation 13 of the 2004 Regulations or is registered in respect of such storage under regulation 11 of those Regulations, shall be —

(a) where the disposal or decontamination is carried out by, or on behalf of, a person who holds a licence granted by the Executive under those Regulations in a case in which the assent of the local authority was required under regulation 13(3) of those Regulations before the licence was granted, the Executive, or

(b) in any other case, the local authority for the area in which the disposal or decontamination is carried out.

(11) For the purposes of paragraphs (7) to (10), “ammonium nitrate blasting intermediate”, “licence”, “licensing authority”, “registered” and “site” have the same meanings as they are

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<sup>(a)</sup> S.I. 1998/494.

given by regulation 2(1) of the 2004 Regulations and “deemed licence” and “deemed registration” have the same meanings as they are given by regulation 27(20) of those Regulations.”.

### **The Quarries Regulations 1999**

**50.** For the definition of “explosives store” in regulation 2(1) of the Quarries Regulations 1999<sup>(a)</sup> (interpretation), substitute —

““explosives store” means a building, enclosed area or metal structure where explosives are stored under a licence granted or registration made under the Manufacture and Storage of Explosives Regulations 2004;”.

### **The Building Regulations 2000**

**51.** For paragraph 1 of Class 1 of Schedule 2 to the Building Regulations 2000<sup>(b)</sup> (exempt buildings and works), substitute —

“1. Any building in which explosives are manufactured or stored under a licence granted under the Manufacture and Storage of Explosives Regulations 2004.”.

### **The Health and Safety (Fees) Regulations 2004**

**52.**—(1) The Health and Safety (Fees) Regulations 2004<sup>(c)</sup> are amended as follows.

(2) In regulation 9 (fees payable under the Explosives Act 1875<sup>(d)</sup> and instruments made thereunder, under the Petroleum (Consolidation) Act 1928<sup>(e)</sup>, the Petroleum (Transfer of Licences) Act 1936<sup>(f)</sup> and the Classification and Labelling of Explosives Regulations 1983<sup>(g)</sup>) —

(a) after paragraph (1), insert —

“(1A) Where any application in relation to a provision specified in column 1 of Part IA of Schedule 8 is made to the Executive, where it is the licensing authority by virtue of paragraphs 1(b) or (c) or 2 of Schedule 1 to the Manufacture and Storage of Explosives Regulations 2004 (“the 2004 Regulations”), for a purpose specified in column 2 of that Part, the fee specified in the corresponding entry in column 3 of that Part shall be payable by the applicant to the Executive.

(1B) Where any application under a provision specified in column 1 of Part IB of Schedule 8 is made to a licensing authority, which is the licensing authority by virtue of paragraph 1(a) of Schedule 1 to the 2004 Regulations, for a purpose specified in column 2 of that Part, the fee specified in the corresponding entry in column 3 of that Part shall be payable by the applicant to that licensing authority.”;

(b) for paragraph (3), substitute —

“(3) A fee shall be payable to the Executive where the Executive requires any work to be carried out by its specialist inspectors in connection with any application in respect of which a fee is payable by virtue of paragraphs (1) or (1A) for any purpose specified in column 2 of each of Parts I and IA of Schedule 8 for which there is a corresponding entry in column 4 of the respective Part, and the fee for work in connection with each such purpose shall be that specified in the corresponding entry in column 4 of that Part for each hour worked, adjusted pro rata for a period worked of less than one hour, and such fee shall be payable prior to notification of the result of the application.”;

(c) in paragraph (4), for “entry (a)” substitute “the entry”;

(d) in paragraph (6), for “Parts III, IV and V” substitute “Parts III and IV”;

(e) after paragraph (8), insert —

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<sup>(a)</sup> S.I. 1999/2024, to which there are amendments not relevant to these Regulations.

<sup>(b)</sup> S.I. 2000/2531, to which there are amendments not relevant to these Regulations.

<sup>(c)</sup> S.I. 2004/456, to which there are amendments not relevant to these Regulations.

<sup>(d)</sup> 1875 c.17.

<sup>(e)</sup> 1928 c.32.

<sup>(f)</sup> 1936 c.27.

<sup>(g)</sup> S.I. 1983/1140, to which there are amendments not relevant to these Regulations.



“(9) For the purposes of this regulation and Schedule 8, “ammonium nitrate blasting intermediate”, “licence”, “licensing authority”, “on-site mixing” and “registration” have the same meanings as in the 2004 Regulations.”.

(3) In Schedule 8 (fees payable under the Explosives Act 1875 and instruments made thereunder, under the Petroleum (Consolidation) Act 1928, the Petroleum (Transfer of Licences) Act 1936 and the Classification and Labelling of Explosives Regulations 1983) —

- (a) in Part I (applications for factory licences, magazine licences, acetylene importation licences and amending licences under sections 6, 12 and 40(9) of the Explosives Act 1875 and replacement of such licences), omit the entries in relation to sections 6 and 12 of the Explosives Act 1875;
- (b) after Part I, insert the following Parts —

## “PART 1A

### APPLICATIONS FOR LICENCES, OR VARIATIONS OF LICENCES, TO MANUFACTURE OR STORE EXPLOSIVES MADE TO THE EXECUTIVE WHERE IT IS THE LICENSING AUTHORITY BY VIRTUE OF PARAGRAPHS 1(b) OR (c) OR 2 OF SCHEDULE 1 TO THE MANUFACTURE AND STORAGE OF EXPLOSIVES REGULATIONS 2004

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
<i>Provision in relation to which the application is made</i>	<i>Purpose of application</i>	<i>Fee</i>	<i>Fee for work by specialist inspector</i>
<b>The Manufacture and Storage of Explosives Regulations 2004</b>			
Regulation 9, as extended by regulation 2(2) of those Regulations to the manufacture of ammonium nitrate blasting intermediate	Application for a licence to manufacture explosives not being ammonium nitrate blasting intermediate nor relating to on-site mixing	£529	£ 111 per hour worked
	Application for a licence to manufacture ammonium nitrate blasting intermediate	£[???	£111 per hour worked
	Application for a licence to manufacture explosives by means of on-site mixing	£[???	£111 per hour worked
	Application for a licence to replace any of the above licences on the expiry of that licence	£73	£111 per hour worked
Regulation 10	Application for licence to store explosives	£529	£111 per hour worked
	Application for a licence to replace the above licence on its expiry	£73	£111 per hour worked
Regulation 16	Application to vary a licence to manufacture or store explosives [or ammonium nitrate	£381	£111 per hour worked

Regulation 20	blasting intermediate???)	
	Application to transfer a licence	£47
	Application to replace any of the licences referred to in this Part if lost	£47

## PART IB

### APPLICATIONS FOR LICENCES TO STORE EXPLOSIVES AND FOR REGISTRATION IN RELATION TO THE STORAGE OF EXPLOSIVES MADE TO LICENSING AUTHORITIES WHICH ARE LICENSING AUTHORITIES BY VIRTUE OF PARAGRAPH 1(a) OF SCHEDULE 1 TO THE MANUFACTURE AND STORAGE OF EXPLOSIVES REGULATIONS 2004

<i>1</i>	<i>2</i>	<i>3</i>
<i>Provision under which application made</i>	<i>Purpose of application</i>	<i>Fee</i>
<b>The Manufacture and Storage of Explosives Regulations 2004</b>		
Regulation 10	Application for a licence to store explosives	£73
Regulation 11	Application for registration in relation to the storage of explosives	£13
Regulation 20	Application to transfer registration	£[???)
	Application to replace the licence or registration referred to above if lost	[£???)

- ”
- (c) in Part II (fee or maximum fee payable in respect of applications for the granting and renewal of an explosives store licence, the registration or renewal of registration of premises used for keeping explosives and the granting and transfer of petroleum-spirit licences), omit the entries in relation to the Explosives Act 1875;
  - (d) in Part V (miscellaneous applications) —
    - (i) in entry (a), omit “or authorisation of an explosive under section 40(9) of the Explosives Act 1875”; and
    - (ii) omit entry (b);
  - (e) in Part VI (further fees payable in respect of certain testing required by the Health and Safety Executive) —
    - (i) in entry (d), omit “or authorisation of an explosive under section 40(9) of the Explosives Act 1875 (Part V above)”; and
    - (ii) omit entry (e).

## **The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2004**

**53.** In regulation 2(1) of the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2004<sup>(a)</sup> (interpretation), for the definition of “safe and secure place” substitute —

““safe and secure place” means a safe and secure place within a site —

- (a) in relation to which a person is licensed to manufacture or store explosives under regulation 13 of the Manufacture and Storage of Explosives Regulations 2004 or is registered in respect of such storage under regulation 11 of those Regulations, or
- (b) in respect of which a certificate of exemption has been granted under the Explosives Act 1875 (Exemption) Regulations 1979<sup>(b)</sup>”.

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<sup>(a)</sup> S.I. 2004/568.

<sup>(b)</sup> S.I. 1979/1378.

SCHEDULE 6

Regulation 28(2) and (3)

REPEALS AND REVOCATIONS

**PART 1**

**REPEALS**

<i>1</i>	<i>2</i>	<i>3</i>
<i>Title</i>	<i>Reference</i>	<i>Extent of repeal</i>
Explosives Act 1875.	c.17.	<p>Sections 4 to 22, 24 to 29, 35, 36, 38, 40 and 41.</p> <p>In section 43, “, either absolutely, or except in pursuance of a license of the Health and Safety Executive under this Act”.</p> <p>Sections 44 to 51, 58, 60, 63 and 64.</p> <p>In section 67, “except as hereafter in this section mentioned,” in paragraph (1), paragraph (4) and the word “and” preceding it.</p> <p>Sections 70 to 72, 77, 78 and 82.</p> <p>In section 83, the words “, and a Secretary of State may by order”, “or orders of the Secretary of State, as the case may be,” and the words from “The provisions of section 50” to the end.</p> <p>Sections 84 and 86.</p> <p>In section 91, the words from “Provided that” to “exceed one month”.</p> <p>In section 97, paragraphs (3) and (4) and the words from “Provided that” to the end.</p> <p>Sections 98 and 101.</p> <p>In section 102, the words from “A continuing certificate” to the end.</p> <p>Sections 103, 105 and 106.</p> <p>In section 108 –</p> <p>(a) in the definition of “this Act”, the words “certificate, byelaw, regulation, rule,”;</p> <p>(b) in the definition of “store”, the words “an existing gunpowder store as defined by this Act, or” and “licensed by a license granted by a local authority under this Act”; and</p> <p>(c) the definitions of</p>

		<p>“existing”, “factory magazine”, “harbour authority”, “canal company”, “railway company”, “safety cartridges” and “Gunpowder Act 1860”.</p> <p>Section 109(11).</p> <p>In section 110, paragraph 2 and the word “and” preceding it.</p> <p>In section 111, paragraph (b) and the word “and” preceding it.</p> <p>Section 113.</p> <p>In section 114, paragraph (a). Schedule 1.</p>
Explosives Act 1923.	c.17.	The whole Act.
Acquisition of Land (Authorisation Procedure) Act 1946*.	c.49.	In Schedule 4, the entry relating to the Explosives Act 1875.
National Parks and Access to the Countryside Act 1949*.	c. 97.	Section 80(5) and (6).
Fireworks Act 1951 <sup>(a)</sup> *.	c.58.	In section 1(1) and (2), “, magazine” in each place where it occurs. Sections 2(6), 4, 5(5) and 7.
Emergency Laws (Miscellaneous Provisions) Act 1953 <sup>(b)</sup> *.	c.47.	Section 3. In section 12(3), the words “three or”. In section 13, the word “three”.
London Government Act 1963*.	c.33.	Section 50(1) and (3).
Public Expenditure and Receipts Act 1968*.	c.14.	In Schedule 3, entry number 4.
Health and Safety at Work etc. Act 1974.	c.37.	In Schedule 1, the entries relating to the Explosives Act 1923, the Fireworks Act 1951 and the Emergency Laws (Miscellaneous Provisions) Act 1953.
Isle of Man Act 1979	c.58.	In section 8(2)(b), the final “or”.
Roads (Scotland) Act 1984*.	c.54.	In Schedule 9, paragraph 7(2).
Merchant Shipping Act 1995*.	c. 21.	In Schedule 13, paragraph 5.
Criminal Procedure	c.46.	In Schedule 5, the entries for

<sup>(a)</sup> The repeals of the provisions in sections 2 and 5 are effected under section 80(1) of the 1974 Act. Sections 4 and 7 are “existing statutory provisions” within the meaning of section 53 of the 1974 Act and are repealed by virtue of section 15(3) (a) of that Act.

<sup>(b)</sup> The repeals of the provisions in sections 12 and 13 are effected under section 80(1) of the 1974 Act. Section 3 is an “existing statutory provision” within the meaning of section 53 and repealed by virtue of section 15(3) (a) of that Act.

(Scotland) Act 1995\*.

the forms of complaint relating to —  
(a) the Explosives Act 1875, section 5; and  
(b) the Explosives Act 1875, section 22 and section 3, subsection (1), Mode B, of the Order in Council dated 26th October 1896.

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**PART 2**  
**REVOCATIONS**

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<i>1</i> <i>Title</i>	<i>2</i> <i>Reference</i>	<i>3</i> <i>Extent of revocation</i>
Order in Council (No. 1) Classifying Explosives.	5th August 1875 (Rev. VII, p.1).	The whole Order.
Order in Council (No. 2) Making General Rules for Factories for Explosives other than Gunpowder.	27th November 1875 (Rev. VII, p.10).	The whole Order.
Order in Council (No. 3) Relating to Magazines for Explosives other than Gunpowder, whether with or without Gunpowder.	27th November 1875 (Rev. VII, p. 10).	The whole Order.
Order in Council (No. 4) Relating to Small Firework Factories.	27th November 1875 (Rev. VII, p.14).	The whole Order.
Order in Council (No. 5) Relating to Stores for Gunpowder Exclusively.	27th November 1875 (Rev. VII, p.22).	The whole Order.
Order in Council (No. 6) Relating to Stores for Mixed Explosives.	27th November 1875 (Rev. VII, p.26).	The whole Order.
Order in Council (No. 9) Relating to the Sale of Explosive.	27th November 1875 (Rev. VII, p.39).	The Whole Order.
Order in Council (No. 11) Respecting Notice to be Given of Accidents Connected with the Conveyance of Explosives other than Gunpowder.	27th November 1875 (Rev. VII, p. 42).	The whole Order.
Order of Secretary of State (No. 1) Applying General Rules to Floating Magazines for Gunpowder.	27th November 1875 (Rev. VII, p. 68).	The whole Order.
Order of Secretary of State (No. 2) Applying General Rules to Floating Magazines for Explosives other than Gunpowder, whether with or without Gunpowder.	27th November 1875 (Rev. VII, p. 70).	The whole Order.
Order of Secretary of State as to Notice by Applicant for Factory or Magazine Licence.	20th May 1876 (Rev. VII, p. 85).	The whole Order.

Order in Council (No. 6A) Amending Order in Council (No.6) of the 27th November 1875 Relating to Stores Licensed for Mixed Explosives	20th April 1883 (Rev.VII p. 34).	The whole Order.
Order in Council (No. 1A) Substituting New Provisions for those of Class 7 in the Order in Council of August 5, 1875, as to the Classification of Explosives.	12th December 1891 (noted Rev. VII, p.1).	The whole Order.
Order in Council (No. 15) Prohibiting Fireworks Consisting of or Containing Sulphur in Admixture with Chlorate of Potassium or other Chlorate.	S.R. & O. 1894/517.	The whole Order.
Order in Council (No. 16) Repealing and Consolidating the Previous Orders Relating to Premises Registered for Mixed Explosives.	S.R. & O. 1896/964.	The whole Order.
Order in Council (No. 19) Relating to the Importation, Keeping, Conveyance, or Sale of Fireworks.	S.R. & O. 1905/8.	The whole Order.
Order in Council (No. 16A) Varying the Order in Council (No.16) of October 26, 1896 Relating to Premises Registered for Mixed Explosives.	S.R. & O. 1906/380.	The whole Order.
Order in Council (No. 16B) Amending Order in Council of October 26, 1896 (No. 16) Relating to the Keeping of Mixed Explosives on Registered Premises.	S.R. & O. 1912/1861.	The whole Order.
Order in Council (No. 1B) Amending Order in Council of August 5, 1875 (No. 1) Relating to the Classification of Explosives.	S.R. & O. 1913/481.	The whole Order.
Order of Secretary of State (No. 2A) Amending Order of Secretary of State (No. 2) of November 1875 Applying General Rules to Floating Magazines for Explosives Other than Gunpowder.	S.R. & O. 1923/926.	The whole Order.
Order in Council (No. 2A) Amending the Order in Council of November 27, 1875 (No. 2), making General Rules for Factories for Explosives other than Gunpowder.	S.R. & O. 1923/1297.	The whole Order.

Order in Council (No. 3A) Amending the Order in Council of November 27, 1875 (No. 3) , as to Magazines for Explosives Other than Gunpowder, whether with or without Gunpowder.	S.R. & O. 1923/1298.	The whole Order.
Order in Council (No. 4A) Amending the Order in Council of November 27, 1875 (No. 4) as to Small Firework Factories.	S.R. & O. 1923/1299.	The whole Order.
Order in Council (No. 6D) Amending the Order in Council of November 27, 1875 (No. 6), as to Stores Licensed for Mixed Explosives.	S.R. & O. 1923/1300.	The whole Order.
Order of the Secretary of State (No. 10), Dated January 18, 1924, Relating to the Processes in which Young Persons May Be Employed in Danger Buildings.	S.R. & O. 1924/55.	The whole Order.
Order of the Secretary of State (No. 11), Dated September 20, 1924, Making Byelaws as to the Conveyance of Explosives on Roads, and in Certain Special Cases.	S.R. & O. 1924/1129.	The whole Order except paragraph 3 and the second paragraph of paragraph 5.
Order in Council (No. 27) (the Explosives (Di-Nitro-Phenol and Di-Nitro-Phenolate) Order, 1927.	S.R. & O. 1927/594.	The whole Order.
Order in Council (No. 29) (The Liquid Oxygen Explosives Order, 1928).	S.R. & O. 1928/1045.	The whole Order.
Order of Secretary of State (No. 11A), Dated December 11, 1939, Relating to the Conveyance of Detonators and Electric Detonators with other Explosive.	S.R. & O. 1939/1787.	The whole Order.
Order of Secretary of State (No. 11C), Dated August 24, 1943, Making a Byelaw Relating to the Conveyance of Explosives in a Carriage or Boat whilst Carrying or Plying for Public Passengers.	S.R. & O. 1943/1252.	The whole Order.
Order of Secretary of State (No. 11D), Dated February 7, 1944, Altering the Byelaws Relating to the Conveyance of Detonators and Electric Detonators with other	S.R. & O. 1944/139.	The whole Order.



Explosive and to the Quantity of Explosive which may be Conveyed in any one Carriage.		
The Conveyance of Explosives Byelaws 1951.	S.I. 1951/869.	The whole Byelaws.
The Stores for Explosives Order 1951.	S.I. 1951/1163.	The whole Order.
The Magazines for Explosives Order 1951.	S.I. 1951/1164.	The whole Order.
The Stores for Explosives Order 1953.	S.I. 1953/1197.	The whole Order.
The Conveyance of Explosives Byelaws 1958.	S.I. 1958/230.	The whole Order.
The Keeping of Fireworks Order 1959.	S.I. 1959/1311.	The whole Order.
The Ammonium Nitrates Mixtures Exemption Order 1967.	S.I. 1967/1485.	The whole Order.
The Classification and Labelling of Explosives Regulations 1983.	S.I. 1983/1140.	Regulation 11.

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## EXPLANATORY NOTE

*(This note is not part of the Regulations)*

**1.** These Regulations make new provision for licensing the manufacture and storage of explosives and for registration in respect of the storage of explosives. As such, they repeal and replace a large number of provisions contained in the Explosives Act 1875 and instruments made under it, which provided the framework for the statutory regime in relation to the manufacture and storage of explosives before these Regulations.

**2.** As before, a person wishing to manufacture or store explosives requires a licence to do so (*regulations 9 and 10*). This requirement is subject to the disapplications included in regulations 9 and 10. An application for a licence should be made to a licensing authority on a form approved by the Health and Safety Executive (“the Executive”) (*regulation 12*).

**3.** Where only a certain amount of explosives are to be stored, a person can apply to a licensing authority for registration in respect of that storage, instead of seeking a licence for it (*regulation 11*).

**4.** “Licensing authority” is defined by regulation 2(1) and Schedule 1; it means, in relation to registration or the storage of no more than 2000 kilograms of certain explosives, the chief officer of police or, where the explosives to be stored are of a type listed in Schedule 1 to the Control of Explosives Regulations 1991 (S.I. 1991/1531), the local authority for the area where the storage is to take place, or the Executive when the explosives are to be stored at a mine or a harbour. The Executive is the licensing authority in any other case.

**5.** Subject to certain disapplications, a person wishing to store explosives must maintain the relevant separation distance prescribed by Schedule 2 between a store and buildings and other places not on the site where the storage takes place (*regulation 5*). “Separation distance” is defined by regulation 2(1).

**6.** In certain cases where the Executive is the licensing authority, the assent of the local authority is required before a licence is granted (*regulations 13(3) and (4) and 14*).

**7.** Grounds for refusing or varying a licence or registration are set out in, respectively, regulations 15 and 16. The grounds for revoking a licence or registration are set out in regulation 17. A person may appeal against a refusal or revocation of registration (*regulation 19*). Licences and registration

**8.** may be transferred (*regulation 20*).

**9.** A licensing authority is required to maintain a register on certain information relating to licences or registrations granted or made by it (*regulation 22 and Schedule 4*).

**10.** Prohibitions concerning explosives are contained in regulations 24 and 25. Power to grant exemptions from the requirements or prohibitions imposed by the Regulations is included under regulation 26. Regulation 27 contains savings and transitional provisions so that, for example, licences granted under the Explosives Act 1875 which are valid immediately before the coming into force of these Regulations continue in force on their existing terms subject to variation and expiry on their expiry date or revocation.

**11.** Amendments to legislation are made by regulation 28(1) and Schedule 5. Repeals and revocations of legislation are made by regulation 28(2) and (3) and Schedule 6.

**12.** The Regulations also amend the Health and Safety (Fees) Regulations 2004 (S.I. 2004/456), so as to update and align the fee provisions in those Regulations with the new licensing and registration provision made by these Regulations.

**13.** [*more on fees : RIA etc*]

**GUIDANCE ON HAZARD TYPE**

The definition of hazard type is given in regulation 2 but is repeated here for ease of reference, together with (in italics) additional explanatory information.

- Hazard Type 1 an explosive which, as a result of, or as a result of any effect of, the conditions of its storage or process of manufacture, has a mass explosion hazard (*a mass explosion is one in which the entire body of explosives explodes as one*);
- Hazard Type 2 an explosive which, as a result of, or as a result of any effect of, the conditions of its storage or process of manufacture, has a serious projectile hazard but does not have a mass explosion hazard;
- Hazard Type 3 an explosive which, as a result of, or as a result of any effect of, the conditions of its storage or process of manufacture, has a fire hazard and either a minor blast hazard or a minor projection hazard, or both, but does not have a mass explosion hazard (*ie those explosives which give rise to considerable radiant heat or which burn to produce a minor blast or projection hazard*); and
- Hazard Type 4 an explosive which, as a result of, or as a result of any effect of, the conditions of its storage or process of manufacture, has a fire or slight explosion hazard, or both, with only local effect (*ie those explosives which present only a low hazard in the event of ignition or initiation, where no significant blast or projection of fragments of appreciable size or range is expected*).

**Hazard Division and Hazard Type**

The Hazard Type system applies to manufacture and storage and reflects the conditions which are found in these situations. This means that in some cases the Hazard Type may differ from the UN/ADR Hazard Division classification for transport - although in the majority of cases the Hazard Type will correspond to the Hazard Division (for example UN HD 1.1 will be HT1).

**Determining Hazard Type**

For those explosives being kept as packaged for carriage, and that have been classified, there will generally be a

direct correlation between the UN Hazard Division assigned them on classification for transport and the Hazard Type they should be allocated for manufacture and storage, ie:

- W UN HD 1.1 = HT1
- W UN HD 1.2 = HT2
- W UN HD 1.3 = HT3
- W UN HD 1.4 = HT4

However, the classification is assigned to the explosives as they are packaged for transport according to the UN Recommendations, and the nature of packaging (or lack of it, and the quantity and arrangement in storage) can have a significant effect on the hazard presented in non transport situations. Therefore an assessment must be made of the hazards presented by explosives throughout the course of their manufacture, storage and handling to ensure that the correct Hazard Type is used under all conditions.

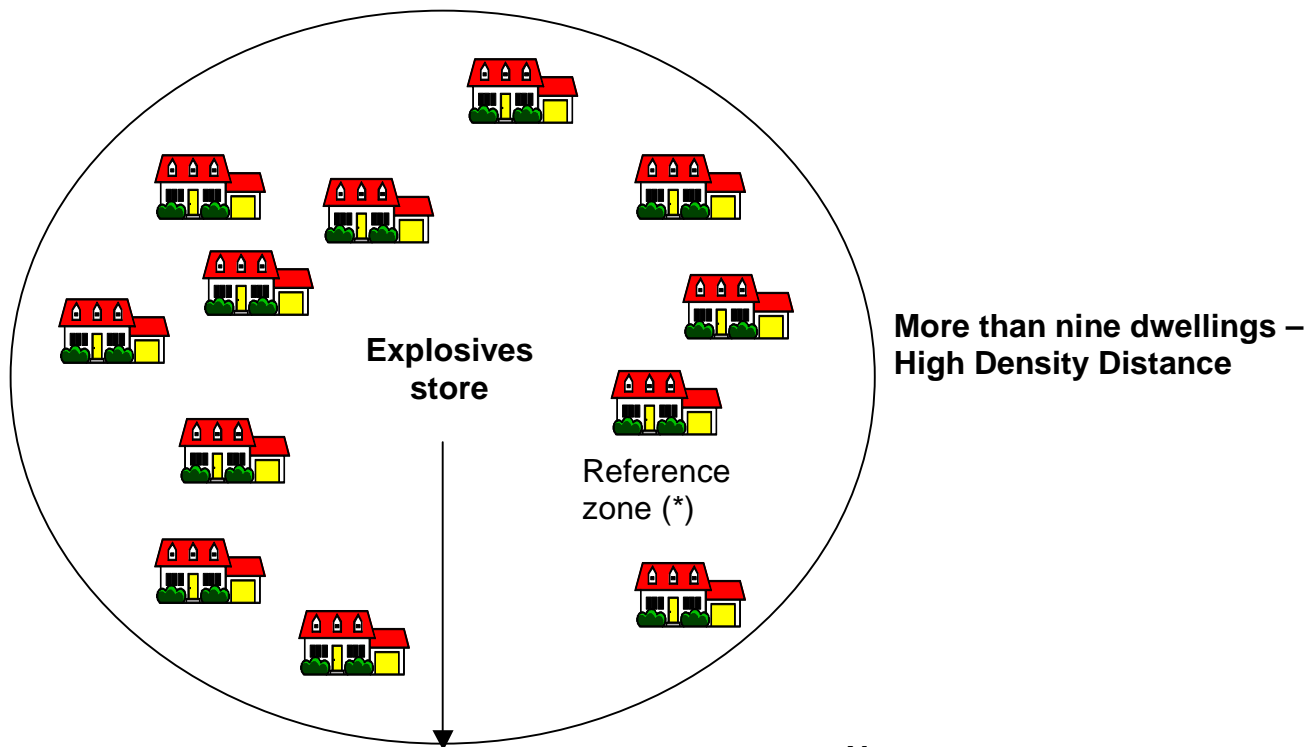
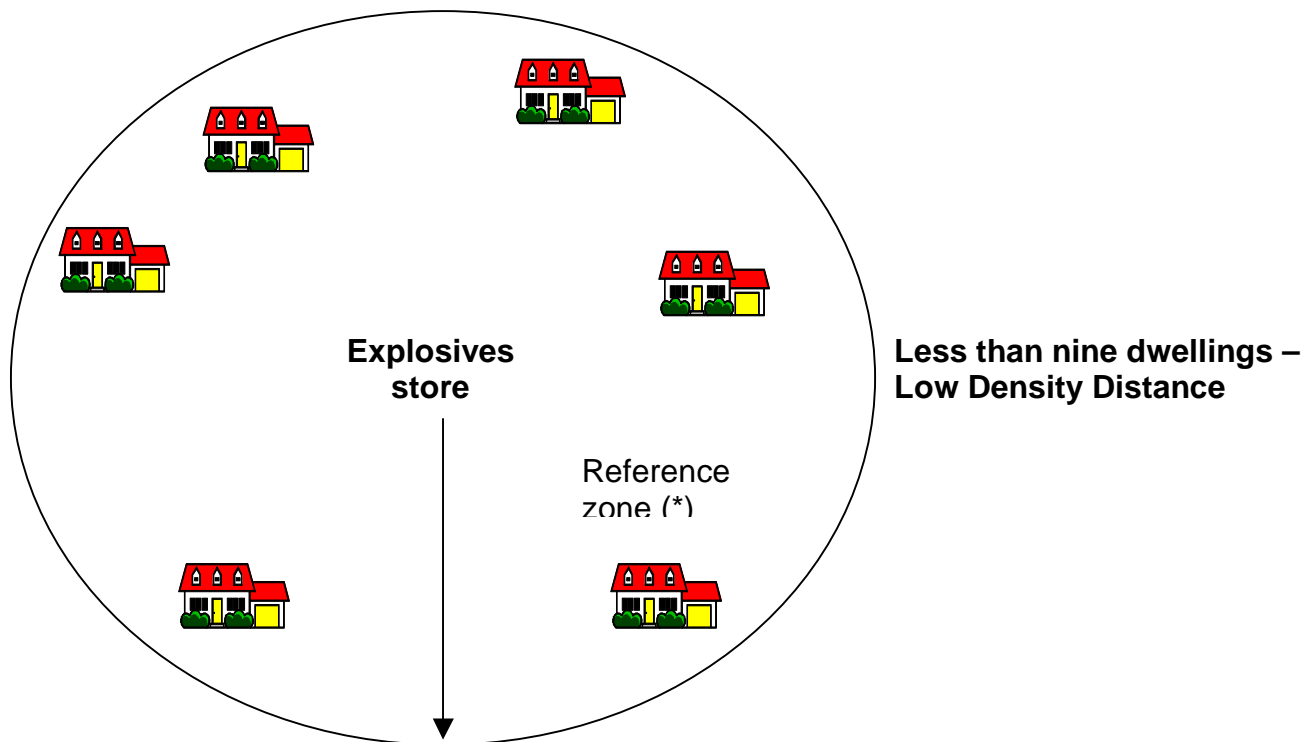
This assessment may require tests and trials to be undertaken to determine how an explosive behaves in particular circumstances, and the hazard type may vary as conditions change. For example:

- propellants classified as UN HD 1.3 would under normal circumstances be regarded as Hazard Type 3. However, under specific circumstances these propellants can be Hazard Type 1. Such circumstances include confinement during processing at elevated pressure and/or temperature, and the critical diameter and bed depth of the material. Examples of where these circumstance may occur are:
  - within an extrusion press (where the critical considerations are critical diameter, confinement, pressure and, with certain pressing operations, elevated temperature; and
  - within a hopper in a cartridge-filling operation (where the critical considerations are propellant depth and confinement);
- some detonators classified as UN Hazard Division 1.4 for transport can also present an HT1 hazard when outside their packaging and stored together.


It is good practice to keep the amount of explosives in boxes or other containers to the minimum practicable and to make arrangements to prevent propagation from one box or some other container to another. For example, an explosion in a box where a large number of percussion caps are kept loose will result in the explosion of the majority of the caps in the box. However, if the same caps are kept in trays where they are separated from one another, the initiation of one cap will not result in the initiation of

the rest of them.

### Working out whether High or Low Density Distances apply



**Note:**

 = dwelling

(\*) Reference zone is twice the low density separation distance



**[SEPARATION DISTANCES NORMALLY USED BY HSE]****How to Use Tables 1 to 8****Which Table Should be Used****Internal Separation Distance (E) (Tables 1 and 2)  
or External Separation Distance (I) (Tables 3 to 8 inclusive)?**

	Explosives Process Building	Explosives Magazine
Explosives Process Building	I	I
Other occupied buildings within the boundary of the licensed factory or magazine site except those described in the next line of this table.	E*	E*
Occupied buildings within the boundary of the licensed factory or magazine meeting one or more of the following criteria: 1) The building is not in the occupation of the applicant. 2) The building has more than one storey, suitable for occupation, above ground. 3) The building is normally occupied by more than 20 people.	E⊕	E⊕
Explosives Magazine	I	I
Other store within the boundary of the licensed factory or magazine site.	I	I
"On site" bulk flammable gas/flammable liquid storage	E	E
Any off site building or work namely any railway, aerodrome, canal (in active use) or other navigable water, dock, pier or jetty; market place, public recreation or sports ground or other open place where the public are accustomed to assemble; public highway; private road which is the principal means of access to a church, chapel, college, school, hospital or factory; river wall, sea wall, reservoir, dwelling house; retail shop; government and public buildings, church, college, chapel, school, hospital, theatre, cinema or other building where the public are accustomed to assemble; motorway; caravan site for which planning permission for this use had been granted and on which is located an occupied caravan for a total period in excess of 28 days in any one calendar year; factory; building or works used for the storage in bulk of petroleum spirit, gas, or other inflammable substances; buildings or works used for the storage and manufacture of explosives or of articles which contain explosives.	E	E

\* Use half the appropriate distance required to a building in Tables 3-8, inclusive, depending on the Hazard Type.

⊕ Use the appropriate distance required to a building in Tables 3-8, inclusive, depending on the Hazard Type.



**Which type of Building Construction should be used For Hazard Type 1 in Tables 3, 4, 5A and 5B?**

<b>Description of Building</b>	<b>Building Construction Type</b>
Brick built surrounded by a mound of earth or other suitable material	Brick-built (mounded)
Concrete built surrounded by a mound of earth or other suitable material	Brick-built (mounded)
Brick built, not mounded	Brick-built (unmounded)
Concrete built, not mounded	Brick-built (unmounded)
Steel built store, with or without attached detonator annex, surrounded by a mound of earth or other suitable material	Metal (mounded)
Steel built store, without attached detonator annex, (or attached detonator annex not used) not mounded	Metal (unmounded), detonator annex removed
Steel built store, with attached detonator annex, not mounded	Metal (unmounded) detonator annex on
Wooden built, surrounded by a mound of earth or other suitable material	Metal, mounded
Wooden built, not mounded	Metal (unmounded) detonator annex removed
Unit risk construction process building, lightweight front and roof, not mounded	Metal, unmounded
Unit risk construction process building, lightweight front and roof, surrounded by a mound of earth or other suitable material	Metal, mounded
Steel framed warehouse type building having roof of lightweight sheeting and walls entirely of lightweight sheeting, unbounded	Metal (unmounded) detonator annex removed
Steel framed warehouse type building having roof of lightweight sheeting, and walls of concrete or brick construction to at least a height of 1 metre, unbounded	Metal (unmounded) detonator annex removed
Earth overmounded building of brick or concrete construction	Metal, mounded
Steel/concrete/steel sandwich hardened construction	Metal, unmounded

### Which Internal Separation Distance Table?

	Explosives Process Building	Explosives Magazine
Explosives process building	Table 2	Table 2
Other occupied buildings within the boundary of the licensed factory or magazine site except those which require an external separation distance (see p.22).	Table 2	Table 2
Explosives magazine	Table 2	Table 1
Other store within the boundary of the licensed factory or magazine	Table 1	Table 1

### Which External Separation Distance Table ?

<b>Explosives building/containing explosives of: Hazard Type 1<sup>1</sup></b>	<b>Use Table<sup>3, 4, 5</sup></b>
Brick built mounded building <sup>2</sup> / Hazard Type 1 <sup>1</sup>	3
Brick built unmounded building <sup>2</sup> / Hazard Type 1 <sup>1</sup>	3
Metal built mounded building with attached detonator annex <sup>2</sup> / Hazard Type 1 <sup>1</sup>	4
Metal built mounded building without detonator annex <sup>2</sup> / Hazard Type 1 <sup>1</sup>	4
Metal built unmounded building with attached detonator annex <sup>2</sup> / Hazard Type 1 <sup>1</sup>	5A
Metal built unmounded building without detonator annex <sup>2</sup> / Hazard Type 1 <sup>1</sup>	5B
Building of any construction / Hazard Type 2 <sup>1</sup>	6
Building of any construction / Hazard Type 3 <sup>1</sup>	7
Building of any construction / Hazard Type 4 <sup>1</sup>	8

#### Notes to the above summary

- 1 Guidance on Hazard Type is given in Annex 1. Where a building contains a mixture of Hazard Types 1, 3 or 4 add the quantities of the various Hazard Types together and treat as the lowest numbered Hazard Type e.g. treat 20 kg of HT1 plus 30 kg of HT3 as 50 kg of HT1. Where a building contains a mixture of Hazard Types 2, 3 or 4, add the quantities of the various types together and treat as the lowest numbered hazard e.g. treat 50 kg of HT2 and 50 kg of HT4 as 100 kg of HT2. Where a building contains a mixture which includes Hazard Type 1 and 2 with or without other Hazard Types, add the quantities of the various hazard types together and treat as Hazard Type 1 or Hazard Type 2, whichever requires the larger separation distance.
- 2 For guidance on selection of building construction see table on previous page.

- 3 Tables 3 to 8 inclusive show in Column 1 two figures in each row for the quantity of explosives (e.g. 25-50 kg). This means in the example, more than 25 kg and no more than 50 kg (i.e. 25.1-50 kg, but not 50.01 kg.)
- 4 For Tables 1 and 2, the distances for quantities of explosives less than 50 kg should be taken to be the same as for 50 kg, unless the explosives inspector advises otherwise. For Tables 3 to 8 inclusive there is no distance requirement for a quantity of explosives less than the minimum figure given in a Table (e.g. less than 0.1 kg in Table 3).
- 5 For Tables 1 and 2, where a distance for the quantity of explosives under consideration is not given because that quantity lies between two quantities given in the table, interpolation may be used. For quantities of explosives in excess of 100,000 kg, the explosives inspector will advise the distance required.
- 6 For Tables 3 – 7 inclusive where the quantity of explosives under consideration is greater than the maximum given in the Table, the distance may be calculated using the appropriate formula given in Annex 3 to this Appendix. For Table 8 where the quantity of explosive under consideration is greater than 30000 kg, the explosives inspector will advise the distance required.

## INTERNAL SEPARATION DISTANCES

**TABLE 1**

<b>Inter-magazine distances (metres)</b>				
<b>Neq (kg)</b>	<b>HT1</b>	<b>HT2</b>	<b>HT3</b>	<b>HT4</b>
50	9	9	9	9
100	11	11	9	9
200	14	14	9	9
300	16	16	10	9
400	18	18	11	9
500	19	19	12	9
1,000	24	24	14	9
2,000	30	30	17	12
3,000	34	34	19	14
4,000	38	38	20	16
5,000	41	41	22	17
10,000	51	51	28	22
15,000	58	58	33	24
20,000	64	64	37	25
25,000	70	70	41	26
30,000	74	74	44	27
40,000	83	83	47	27
50,000	89	89	50	27
60,000	94	94	54	27
80,000	105	105	63	27
100,000	115	115	70	27

Note, for HT1 and HT2, these distances are based on there being mounding or other equally effective measures to intercept low angle high-energy missiles arising from an explosion of HT1 or HT2 explosives.

## INTERNAL SEPARATION DISTANCES

**TABLE 2**

<b>Process Building Distances (metres)</b>					
Neq (kg)	HT1	HT2		HT3	HT4
		<0.7 kg	> 0.7 kg		
50	18	15	32	12	11
100	22	18	46	15	11
200	27	22	61	18	11
300	30	24	69	21	11
400	33	25	75	23	11
500	36	27	79	25	11
1,000	56	31	92	32	12
2,000	85	36	105	40	19
3,000	106	40	112	46	23
4,000	122	42	117	50	24
5,000	134	44	121	54	25
10,000	176	50	133	68	27
15,000	204	54	140	78	27
20,000	225	57	144	86	27
25,000	243	60	148	93	27
30,000	258	62	151	98	27
40,000	275	66	156	110	27
50,000	295	68	159	120	27
60,000	315	70	162	130	27
80,000	345	74	166	140	27
100,000	375	76	170	150	27

Note, for HT1 and HT2, these distances are based on there being mounding or other equally effective measures to intercept low angle high-energy missiles arising from an explosion of HT1 or HT2 explosives.

# EXTERNAL SEPARATION DISTANCES

## TABLE 3

### HAZARD TYPE 1 IN A BRICK BUILT BUILDING

Q Kg	Unmounded (All distances are in metres)				Mounded (All distances are in metres)									
	Foot † Path + Lightly Used Road + Water Way	Minor † Road + Railway Line ⊕	Major † Road + Place of Public resort + Buildings *	Vulnerable Building Distance	Reference Zone Radius		Low or High Density		Low Density	High Density		Low or High Density		
					Max No Dwellings in Reference Zone to remain Low Density	Footpath + Lightly Used Road + Water way	Minor Road + Railway Line ⊕	Major Road + Place of Public resort + Buildings	Major Road + Place of Public resort + Buildings * (except dwellings – distances for these are in the next column	Dwellings	Vulnerable Building Distance			
0.1-25	47	71	141	141			34	51	101		←	101		
25-50	53	80	160	160			36	54	107		←	107		
50-75	60	90	180	180			37	56	112		←	112		
75-100	67	100	199	199			39	59	118		←	118		
100-150	77	115	230	230										
150-200	85	128	256	256			257	81	43	64	128	128	142	128
200-300	98	147	293	293			278	96	46	69	139	139	156	139
300-400	107	160	320	320			322	128	54	81	161	161	180	161
400-450	110	166	331	331					54	92	183		←	183
450-500	113	170	340	340					64	97	193		←	193
500-600	118	178	355	355					68	102	204		←	204
600-700	122	184	367	367					68	102	204		←	216
700-800	126	189	377	377			408	206	68	102	204	204	231	238
800-900	128	193	385	385			408	206	68	102	204	204	238	260
900-1000	131	196	392	392			408	206	68	102	204	204	245	280
1000-1100	133	199	398	398			408	206	68	102	204	204	250	300
1100-1200	133	199	398	398			408	206	68	102	204	204	255	319
1200-1300	134	202	403	403			408	206	68	102	204	204	259	337
1300-1400	136	204	408	408			408	206	68	102	204	204	263	354
1400-1500	137	206	412	412			408	206	68	102	204	204	266	370
1500-1600	138	208	415	415			408	206	68	102	204	204	269	386
1600-1700	139	209	418	418			408	206	68	102	204	204	272	402
1700-1800	140	210	421	421			408	206	68	102	204	204	274	416
1800-1900	141	212	424	431			416	214	69	104	208	208	277	431
1900-2000	142	213	426	444			431	229	72	108	215	215	279	444
2000-3000	143	214	428	458			444	244	74	111	222	222	279	444
3000-4000	147	221	442	570			458	259	76	115	229	229	281	458
4000-5000	150	225	449	656					95	143	285		←	570
5000-10000	151	227	454	724					109	164	328		←	656
10000-15000	165	248	495	950					121	181	362		←	724
15000-20000	183	275	550	1097					158	239	475		←	950
20000-25000	202	303	606	1211					183	274	548		←	1097
25000-30000	218	327	653	1306					202	303	606		←	1211
	232	348	695	1389					218	327	653		←	1306
									232	348	695		←	1389

← Means that high-density distances do not apply for these quantities, required distance will be found in next column in direction of arrow.

⊕ Use these distances also for any aerodrome, dock, pier, jetty, river wall, sea wall, reservoir

\* Use these distances also for any retail shop; government and public buildings, church, college, chapel, school, hospital, theatre, cinema or other building where the public are accustomed to assemble; motorway; caravan site for which planning permission for this use has been granted and on which is located an occupied caravan for a total period in excess of 28 days in any one calendar year; factory; building or works used for the storage in bulk of petroleum spirit, gas, or other inflammable substances; buildings or works used for the storage and manufacture of explosives or of articles which contain explosives.

†Footpath includes a bridleway or other thoroughfare which is not a road, but does not include a footpath used by no more than 20 persons every 24 hours. "Lightly-used road" means a road used by more than 20 and fewer than 500 vehicles every 24 hours. "Minor road" means a road used by more than 500 vehicles every 24 hours, other than a major road. "Major road" means a road used by more than 10,000 vehicles every 24 hours. "Waterway" does not include a waterway navigated by no more than 20 persons every 24 hours.

**EXTERNAL SEPARATION DISTANCES**  
**TABLE 4**  
**HAZARD TYPE 1 IN A METAL BUILT MOUNDED BUILDING**

Q Kg	Reference Zone Radius  (Metres)	Max No of Dwellings in Ref Zone to Remain Low Density	Low Density or High Density		Low Density	High Density		Vulnerable  Building Distance  (Metres)
			Footpath † + Lightly † Used Road + Waterway (Metres)	Minor Road † + Railway Line ⊕ (Metres)	Major Road + Place of Public Resort + Buildings (Metres) *	Major Road + Place of Public Resort + Buildings * (Except Dwellings – distances for these are in the next column) (Metres)	Dwellings  (Metres)	
0.1-25	68	6	11	17	34	34	45	40
25-50	74	7	12	18	37	37	45	48
50-75	80	8	13	20	40	40	45	54
75-100	86	9	14	22	43	43	48	66
100-150	97	12	16	32	49	49	55	86
150-200	109	15	18	27	54	54	62	104
200-300	136	23	23	34	68	68	76	136
300-400	NOT APPLICABLE		28	42	83		←	165
400-450			30	45	89		←	178
450-500			32	48	96		←	191
500-600			36	54	108		←	216
600-700			40	60	119		←	238
700-800			43	65	130		←	260
800-900			47	70	140		←	280
900-1000			50	75	150		←	300
1000-1100			53	80	159		←	319
1100-1200			56	84	168		←	337
1200-1300			59	89	177		←	354
1300-1400			62	93	185		←	370
1400-1500			64	97	193		←	386
1500-1600			67	101	201		←	402
1600-1700			69	104	208		←	416
1700-1800			72	108	215		←	431
1800-1900			74	111	222		←	444
1900-2000			76	115	229		←	458
2000-3000			95	143	285		←	570
3000-4000			109	164	328		←	656
4000-5000	121	181	362		←	724		
5000-10000	158	238	475		←	950		
10000-15000	183	274	548		←	1097		
15000-20000	202	303	606		←	1211		
20000-25000	218	327	653		←	1306		
25000-30000	232	348	695		←	1389		

← Means that high-density distances do not apply for these quantities, the required distance is in the next column in the direction of the arrow.

⊕ Use these distances also for any aerodrome, dock, pier, jetty, river wall, sea wall, reservoir

\* Use these distances also for any retail shop; government and public buildings, church, college, chapel, school, hospital, theatre, cinema or other building where the public are accustomed to assemble; motorway; caravan site for which planning permission for this use has been granted and on which is located an occupied caravan for a total period in excess of 28 days in any one calendar year; factory; building or works used for the storage in bulk of petroleum spirit, gas, or other inflammable substances;

buildings or works used for the storage and manufacture of explosives or of articles which contain explosives.

†Footpath includes a bridleway or other thoroughfare which is not a road, but does not include a footpath used by no more than 20 persons every 24 hours. "Lightly-used road" means a road used by more than 20 and fewer than 500 vehicles every 24 hours. "Minor road" means a road used by more than 500 vehicles every 24 hours, other than a major road. "Major road" means a road used by more than 10,000 vehicles every 24 hours. "Waterway" does not include a waterway navigated by No more than 20 persons every 24 hours.



**EXTERNAL SEPARATION DISTANCES**

**TABLE 5A**

**HAZARD TYPE 1 IN A METAL BUILT UNMOUNDED BUILDING – NO DETONATOR ANNEX ATTACHED**

Q Kg	(All distances are in metres)							
	Reference Zone Radius	Max No Dwelling in Reference Zone to remain Low Density	Low or High Density		Low Density	High Density		Low or High Density
			Footpath † + Lightly Used † Road + Waterway	Minor Road † + Rail Way Line ⊕	Major Road † + Place of Public Resort + Buildings *	Major Road + Buildings * (except dwellings – distances for these are in the next column)	Dwellings	Vulnerable Building Distance
0.1-10	46	3	8	12	23	23	30	40
10-20	57	4	10	15	29	29	35	42
20-30	65	5	11	17	33	33	39	44
30-40	71	6	12	18	36	36	42	46
40-50	76	7	13	19	38	38	44	48
50-60	80	8	13	20	40	40	46	48
60-70	84	9	14	21	42	42	48	52
70-80	87	9	14	22	43	43	50	57
80-90	89	10	15	22	44	44	52	61
90-100	91	10	15	23	45	45	55	66
100-150	100	12	17	25	50	50	66	86
150-200	110	15	18	28	55	55	78	104
200-300	136	23	23	34	68	68	101	136
300-400	165	34	28	42	83	83	124	165
400-450	178	39	30	45	89	89	135	178
450-500	191	45	32	48	96	96	138	191
500-600	216	57	36	54	108	108	144	216
600-700	238	70	40	60	119	119	150	238
700-800	260	83	43	65	130	130	156	260
800-900	280	97	47	70	140	140	162	280
900-1000	300	111	50	75	150	150	168	300
1000-1100	318	111	53	80	159	159	168	319
1100-1200	NOT APPLICABLE		56	84	168		←	337
1200-1300			59	89	177		←	354
1300-1400			62	93	185		←	370
1400-1500			64	97	193		←	386
1500-1600			67	101	201		←	402
1600-1700			69	104	208		←	416
1700-1800			72	108	215		←	431
1800-1900			74	111	222		←	444
1900-2000			76	115	229		←	458
2000-3000			95	143	285		←	570
3000-4000			109	164	328		←	656
4000-5000			121	181	362		←	724
5000-10000			158	238	475		←	950
10000-15000			183	274	548		←	1097
15000-20000			202	303	606		←	1211
20000-25000			218	327	653		←	1306
25000-30000	232	348	695		←	1389		

← Means that high-density distances do not apply for these quantities, the required distance is in the next column in direction of arrow.

⊕ Use these distances also for any aerodrome, dock, pier, jetty, river wall, sea wall, reservoir

\* Use these distances also for any retail shop; government and public buildings, church, college, chapel, school, hospital, theatre, cinema or other building where the public are accustomed to assemble; motorway; caravan site for which planning permission for this use has been granted and on which is located an occupied caravan for a total period in excess of 28 days in any one calendar year; factory; building or works used for the storage in bulk of petroleum spirit, gas, or other inflammable substances; buildings or works used for the storage and manufacture of explosives or of articles which contain explosives.

† "Footpath" includes a bridleway or other thoroughfare which is not a road, but does not include a footpath used by no more than 20 persons every 24 hours. "Lightly-used road" means a road used by more than 500 vehicles every 24 hours. "Minor road" means a road used by more than 500 vehicles every 24 hours, other than a major road. "Major road" means a road used by more than 10,000 vehicles every 24 hours. "Waterway" does not include a waterway navigated by no more than 20 persons every 24 hours.

## EXTERNAL SEPARATION DISTANCES

### TABLE 5B

#### HAZARD TYPE 1 METAL BUILT UNMOUNDED BUILDING – WITH A DETONATOR ANNEX ATTACHED

Q Kg	(All distances are in metres)							
	Reference Zone Radius	Max No Dwellings in Reference Zone to remain Low Density	Low or High Density		Low Density	High Density		Low or High Density
			Footpath † + Lightly Used Road + Waterway	Minor Road † + Rail Way Line ⊕	Major Road + Place of Public Resort + Buildings *	Major Road + Place of Public Resort + Buildings * (except dwellings – distances are in the next column)	Dwellings	Vulnerable Building Distance
0.1-25	74	11	13	19	38	38	53	54
25-50	86	11	14	29	43	43	53	54
50-75	96	11	16	24	48	48	60	54
75-100	106	14	18	27	53	53	77	66
100-150	127	20	21	32	63	63	110	86
150-200	147	27	25	50	74	74	143	104
200-300	188	44	31	47	94	94	209	136
300-400	229	65	38	58	115	115	275	165
400-450	250	77	42	63	125	125	308	178
450-500	257	81	43	64	128	128	309	191
500-600	270	90	45	68	135	135	311	216
600-700	283	99	47	71	142	142	312	238
700-800	297	109	49	74	148	148	314	260
800-900	310	119	52	78	155	155	316	280
900-1000	324	129	54	81	162	162	318	300
1000-1100	337	140	56	85	196	169	319	319
1100-1200	350	152	58	88	175	175	321	337
1200-1300	364	163	61	91	182	182	323	354
1300-1400	377	176	63	95	189	189	325	370
1400-1500	391	188	65	98	195	195	326	386
1500-1600	404	202	67	101	202	202	328	402
1600-1700	417	215	70	105	209	209	330	416
1700-1800	431	229	72	108	215	215	332	431
1800-1900	444	244	74	111	222	222	333	444
1900-2000	458	259	77	115	229	229	335	458
2000-3000	570	401	95	143	285	285	363	570
3000-4000	656	531	109	164	328	328	370	656
4000-5000	NOT APPLICABLE		121	181	362	←	724	
5000-10000			158	238	475	←	950	
10000-15000			182	274	548	←	1097	
15000-20000			202	303	606	←	1211	
20000-25000			218	327	653	←	1306	
25000-30000			232	348	695	←	1389	

← Means that high-density distances do not apply for these quantities, the required distance is in the next column in direction of arrow.

⊕ Use these distances also for any aerodrome, dock, pier, jetty, river wall, sea wall, reservoir

\* Use these distances also for any retail shop; government and public buildings, church, college, chapel, school, hospital, theatre, cinema or other building where the public are accustomed to assemble; motorway; caravan site for which planning permission for this use has been granted and on which is located an occupied caravan for a total period in excess of 28 days in any one calendar year; factory; building or works used for the storage in bulk of petroleum spirit, gas, or other inflammable substances; buildings or works used for the storage and manufacture of explosives or of articles which contain explosives.

† "Footpath" includes a bridleway or other thoroughfare which is not a road, but does not include a footpath used by no more than 20 persons every 24 hours. "Lightly-used road" means a road used by more than 500 vehicles every 24 hours. "Minor road" means a road used by more than 500 vehicles every 24 hours, other than a major road. "Major road" means a road used by more than 10,000 vehicles every 24 hours. "Waterway" does not include a waterway navigated by no more than 20 persons every 24 hours.

**EXTERNAL SEPARATION DISTANCES**  
**TABLE 6**  
**HAZARD TYPE 2**

Quantity of Explosives (kg)	Some or all items being of more than 0.7 kg net mass per item			Every item being not more than 0.7 kg net mass per item		
	Footpath† + Lightly Used Road + Waterway	Minor Road† + Railway Line ⊕	Major Road† + Place of Public Resort + Buildings *	Footpath† + Lightly Used Road + Waterway	Minor Road† + Railway Line ⊕	Major Road† + Place of Public Resort + Buildings *
0.1-25	15	23	45	12	19	37
25-50	29	44	88	14	22	43
50-75	36	54	108	16	24	47
75-100	43	65	129	17	26	51
100-150	49	74	148	19	28	56
150-200	56	84	168	20	30	60
200-300	64	96	191	22	33	66
300-400	69	104	207	24	36	71
400-450	71	107	213	24	37	73
450-500	73	110	219	25	37	74
500-600	75	113	226	25	38	76
600-700	78	117	233	26	39	78
700-800	80	120	240	27	41	81
800-900	83	124	248	28	42	84
900-1000	85	128	256	29	44	87
1000-1100	86	130	259	29	44	88
1100-1200	87	131	262	30	45	89
1200-1300	89	133	266	30	45	90
1300-1400	90	135	270	30	46	91
1400-1500	91	137	274	31	46	92
1500-1600	93	139	278	31	47	94
1600-1700	94	141	282	32	48	95
1700-1800	95	143	286	32	49	97
1800-1900	96	144	288	33	50	99
1900-2000	97	146	292	34	51	101
2000-3000	104	156	312	37	55	110
3000-4000	109	163	326	39	59	117
4000-5000	112	169	337	41	61	122
5000-10000	123	185	370	47	70	140
10000-15000	129	194	388	50	76	151
15000-20000	134	201	401	53	80	159
20000-25000	137	206	411	55	83	166
25000-30000	140	210	419	57	86	171

⊕ Use these distances also for any aerodromes, dock, pier, jetty, river wall, sea wall, reservoir.

\*Use these distances also for any retail shop; government and public buildings, church, college, chapel, school, hospital, theatre, cinema or other building where the public are accustomed to assemble; motorway; caravan site for which planning permission for this use has been granted and on which is located an occupied caravan for a total period in excess of 28 days in any one calendar year; factory; building or works used for the storage in bulk of petroleum spirit, gas, or other inflammable substances; buildings or works used for the storage and manufacture of explosives or of articles which contain explosives.

†Footpath includes a bridleway or other thoroughfare which is not a road, but does not include a footpath used by no more than 20 persons every 24 hours. "Lightly-used road" means a road used by more than 20 and fewer than 500 vehicles every 24 hours. "Minor road" means a road used by more than 500 vehicles every 24 hours, other than a major road. "Major road" means a road used by more than 10,000 vehicles every 24 hours. "Waterway" does not include a waterway navigated by no more than 20 persons every 24 hours.

Note For Hazard Type 2 explosives, there are no extended distances for vulnerable buildings. Apply the distances in column 4 or 7 as appropriate for such buildings.

**EXTERNAL SEPARATION DISTANCES**

<b>TABLE 7 HAZARD TYPE 3</b>			
Quantity of Explosives (Kg)	Footpath† + Lightly Used Road† +Waterway (m)	Minor Road† + Railway Line ⊕ (m)	Major Road† + Place of Public Resort + Buildings * (m)
0.1-25	0	0	0
25-50	8	12	23
50-75	8	13	25
75-100	10	15	29
100-150	11	17	33
150-200	12	19	37
200-300	14	21	42
300-400	16	24	47
400-450	16	24	47
450-500	17	25	50
500-600	17	26	51
600-700	18	27	53
700-800	18	27	54
800-900	18	28	55
900-1000	21	32	63
1000-1100	23	35	70
1100-1200	24	36	71
1200-1300	24	36	72
1300-1400	24	37	73
1400-1500	25	37	74
1500-1600	25	38	75
1600-1700	25	38	76
1700-1800	26	39	78
1800-1900	26	40	79
1900-2000	27	40	80
2000-3000	30	41	91
3000-4000	33	50	100
4000-5000	36	54	107
5000-10000	45	68	136
10000-15000	52	78	156
15000-20000	57	86	172
20000-25000	62	93	185
25000-30000	66	100	199

<b>TABLE 8</b>			
<b>HAZARD TYPE 4</b>			
Quantity of Explosives (Kg)	Footpath† + Lightly Used Road† + Waterway (m)	Minor Road† + Railway Line ⊕ (m)	Major Road† + Place of Public Resort + Buildings * (m)
0.1-250	0	0	0
250-300	1	1	1
300-340	1	1	2
340-370	1	2	3
370-400	1	2	4
400-450	2	3	5
450-500	2	3	6
500-550	2	4	7
550-650	3	4	8
650-700	3	5	10
700-750	4	6	11
750-800	4	6	12
800-900	4	7	13
900-950	5	7	14
950-1000	5	8	15
1000-1100	5	8	16
1100-1150	6	9	17
1150-1200	6	9	18
1200-1300	6	10	19
1300-1350	7	10	20
1350-1400	7	11	21
1400-1450	7	11	22
1500-1550	8	12	23
1550-1600	8	12	24
1600-1650	8	13	25
1650-1700	9	13	26
1700-1800	9	14	27
1800-1850	9	14	28
1850-1900	10	15	29
1900-2000	10	15	30
2000-3000	12	18	35
3000-4000	13	20	40
4000-5000	15	23	45
5000-10000	17	26	51
10000-15000	18	27	54
15000-20000	18	28	55
20000-25000	19	29	58
25000-30000	20	30	60

⊕ Use these distances also for any aerodromes, dock, pier, jetty, river wall, sea wall, reservoir.

\* Use these distances also for any retail shop; government and public buildings, church, college, chapel, school, hospital, theatre, cinema or other building where the public are accustomed to assemble; motorway, caravan site for which planning permission for this area had been granted and on which is located an occupied caravan for a total period in excess of 28 days in any one calendar year; factory; building or works used for the storage in bulk of petroleum spirit, gas, or other inflammable substances; buildings or works used for the storage and manufacture of explosives or of articles which contain explosives.

† "Footpath" includes a bridleway or other thoroughfare which is not a road, but does not include a footpath used by no more than 20 persons every 24 hours. "Lightly-used road" means a road used by more than 20 or fewer than 500 vehicles every 24 hours. "Minor road" means a road used by more than 500 vehicles every 24 hours, other than a major road, "Major road" means a road used by more than 10,000 vehicles every 24 hours "Waterway" does not include a waterway navigated by no more than 20 persons every 24 hours.

Note For Hazard Type 3 and Hazard Type 4 explosives, there are no extended distances for vulnerable buildings. Apply the distances in Column 4 of Table 7 or Table 8 as appropriate for such buildings.



permission for this use has been granted and on which is located an occupied caravan for a total period in excess of 28 days in any one calendar year; factory; building or works used for the storage in bulk of petroleum spirit, gas, or other inflammable substances; buildings or works used for the storage and manufacture of explosives or of articles which contain explosives.

†Footpath includes a bridleway or other thoroughfare which is not a road, but does not include a footpath used by no more than 20 persons every 24 hours. "Lightly-used road" means a road used by more than 20 and fewer than 500 vehicles every 24 hours. "Minor road" means a road used by more than 500 vehicles every 24 hours, other than a major road. "Major road" means a road used by more than 10,000 vehicles every 24 hours. "Waterway" does not include a waterway navigated by no more than 20 persons every 24 hours.



**EXTERNAL SEPARATION DISTANCES**  
**TABLE 4**  
**HAZARD TYPE 1 IN A METAL BUILT MOUNDED BUILDING**

Q Kg	Reference Zone Radius  (Metres)	Max No of Dwellings in Ref Zone to Remain Low Density	Low Density or High Density		Low Density	High Density		Vulnerable  Building Distance  (Metres)
			Footpath † + Lightly † Used Road + Waterway (Metres)	Minor Road † + Railway Line ⊕ (Metres)	Major Road + Place of Public Resort + Buildings (Metres) *	Major Road + Place of Public Resort + Buildings * (Except Dwellings – distances for these are in the next column) (Metres)	Dwellings  (Metres)	
0.1-25	68	6	11	17	34	34	45	40
25-50	74	7	12	18	37	37	45	48
50-75	80	8	13	20	40	40	45	54
75-100	86	9	14	22	43	43	48	66
100-150	97	12	16	32	49	49	55	86
150-200	109	15	18	27	54	54	62	104
200-300	136	23	23	34	68	68	76	136
300-400	NOT APPLICABLE		28	42	83		←	165
400-450			30	45	89		←	178
450-500			32	48	96		←	191
500-600			36	54	108		←	216
600-700			40	60	119		←	238
700-800			43	65	130		←	260
800-900			47	70	140		←	280
900-1000			50	75	150		←	300
1000-1100			53	80	159		←	319
1100-1200			56	84	168		←	337
1200-1300			59	89	177		←	354
1300-1400			62	93	185		←	370
1400-1500			64	97	193		←	386
1500-1600			67	101	201		←	402
1600-1700			69	104	208		←	416
1700-1800			72	108	215		←	431
1800-1900			74	111	222		←	444
1900-2000			76	115	229		←	458
2000-3000			95	143	285		←	570
3000-4000			109	164	328		←	656
4000-5000	121	181	362		←	724		
5000-10000	158	238	475		←	950		
10000-15000	183	274	548		←	1097		
15000-20000	202	303	606		←	1211		
20000-25000	218	327	653		←	1306		
25000-30000	232	348	695		←	1389		

← Means that high-density distances do not apply for these quantities, the required distance is in the next column in the direction of the arrow.

⊕ Use these distances also for any aerodrome, dock, pier, jetty, river wall, sea wall, reservoir

\* Use these distances also for any retail shop; government and public buildings, church, college, chapel, school, hospital, theatre, cinema or other building where the public are accustomed to assemble; motorway; caravan site for which planning permission for this use has been granted and on which is located an occupied caravan for a total period in excess of 28 days in any one calendar year; factory; building or works used for the storage in bulk of petroleum spirit, gas, or other inflammable substances; buildings or works used for the storage and manufacture of explosives or of articles which contain explosives.

†Footpath includes a bridleway or other thoroughfare which is not a road, but does not include a footpath used by no more than 20 persons every 24 hours. "Lightly-used road" means a road used by more than 20 and fewer than 500 vehicles every 24 hours. "Minor road" means a road used by more than 500 vehicles every 24 hours, other than a major road. "Major road" means a road used by more than 10,000 vehicles every 24 hours. "Waterway" does not include a waterway navigated by No more than 20 persons every 24 hours.

# EXTERNAL SEPARATION DISTANCES

## TABLE 5A

### HAZARD TYPE 1 IN A METAL BUILT UNMOUNDED BUILDING – NO DETONATOR ANNEX ATTACHED

Q Kg	(All distances are in metres)							
	Reference Zone Radius	Max No Dwelling in Reference Zone to remain Low Density	Low or High Density		Low Density	High Density		Low or High Density
			Footpath † + Lightly Used † Road + Waterway	Minor Road † + Rail Way Line ⊕	Major Road † + Place of Public Resort + Buildings *	Major Road + Buildings * (except dwellings – distances for these are in the next column)	Dwellings	
0.1-10	46	3	8	12	23	23	30	40
10-20	57	4	10	15	29	29	35	42
20-30	65	5	11	17	33	33	39	44
30-40	71	6	12	18	36	36	42	46
40-50	76	7	13	19	38	38	44	48
50-60	80	8	13	20	40	40	46	48
60-70	84	9	14	21	42	42	48	52
70-80	87	9	14	22	43	43	50	57
80-90	89	10	15	22	44	44	52	61
90-100	91	10	15	23	45	45	55	66
100-150	100	12	17	25	50	50	66	86
150-200	110	15	18	28	55	55	78	104
200-300	136	23	23	34	68	68	101	136
300-400	165	34	28	42	83	83	124	165
400-450	178	39	30	45	89	89	135	178
450-500	191	45	32	48	96	96	138	191
500-600	216	57	36	54	108	108	144	216
600-700	238	70	40	60	119	119	150	238
700-800	260	83	43	65	130	130	156	260
800-900	280	97	47	70	140	140	162	280
900-1000	300	111	50	75	150	150	168	300
1000-1100	318	111	53	80	159	159	168	319
1100-1200	NOT APPLICABLE		56	84	168	←		337
1200-1300			59	89	177	←		354
1300-1400			62	93	185	←		370
1400-1500			64	97	193	←		386
1500-1600			67	101	201	←		402
1600-1700			69	104	208	←		416
1700-1800			72	108	215	←		431
1800-1900			74	111	222	←		444
1900-2000			76	115	229	←		458
2000-3000			95	143	285	←		570
3000-4000			109	164	328	←		656
4000-5000			121	181	362	←		724
5000-10000			158	238	475	←		950
10000-15000			183	274	548	←		1097
15000-20000			202	303	606	←		1211
20000-25000			218	327	653	←		1306
25000-30000			232	348	695	←		1389

← Means that high-density distances do not apply for these quantities, the required distance is in the next column in direction of arrow.

⊕ Use these distances also for any aerodrome, dock, pier, jetty, river wall, sea wall, reservoir

\* Use these distances also for any retail shop; government and public buildings, church, college, school, hospital, theatre, cinema or other building where the public are accustomed to assemble; motorway; caravan site for which planning permission for this use has been granted and on which is located an occupied caravan for a total period in excess of 28 days in any one calendar year; factory; building or works used for the storage in bulk of petroleum spirit, gas, or other inflammable substances; buildings or works used for the storage and manufacture of explosives or of articles which contain explosives.

† "Footpath" includes a bridleway or other thoroughfare which is not a road, but does not include a footpath used by no more than 20 persons every 24 hours. "Lightly-used road" means a road used by more than 500 vehicles every 24 hours. "Minor road" means a road used by more than 500 vehicles every 24 hours, other than a major road. "Major road" means a road used by more than 10,000 vehicles every 24 hours. "Waterway" does not include a waterway navigated by no more than 20 persons every 24 hours.

# EXTERNAL SEPARATION DISTANCES

## TABLE 5B

### HAZARD TYPE 1 METAL BUILT UNMOUNDED BUILDING – WITH A DETONATOR ANNEX ATTACHED

Q Kg	(All distances are in metres)							
	Reference Zone Radius	Max No Dwellings in Reference Zone to remain Low Density	Low or High Density		Low Density	High Density		Low or High Density
			Footpath † + Lightly Used † Road + Waterway	Minor Road † + Rail Way Line ⊕	Major Road + Place of Public Resort + Buildings *	Major Road + Place of Public Resort + Buildings * (except dwellings – distances are in the next column)	Dwellings	Vulnerable Building Distance
0.1-25	74	11	13	19	38	38	53	54
25-50	86	11	14	29	43	43	53	54
50-75	96	11	16	24	48	48	60	54
75-100	106	14	18	27	53	53	77	66
100-150	127	20	21	32	63	63	110	86
150-200	147	27	25	50	74	74	143	104
200-300	188	44	31	47	94	94	209	136
300-400	229	65	38	58	115	115	275	165
400-450	250	77	42	63	125	125	308	178
450-500	257	81	43	64	128	128	309	191
500-600	270	90	45	68	135	135	311	216
600-700	283	99	47	71	142	142	312	238
700-800	297	109	49	74	148	148	314	260
800-900	310	119	52	78	155	155	316	280
900-1000	324	129	54	81	162	162	318	300
1000-1100	337	140	56	85	196	169	319	319
1100-1200	350	152	58	88	175	175	321	337
1200-1300	364	163	61	91	182	182	323	354
1300-1400	377	176	63	95	189	189	325	370
1400-1500	391	188	65	98	195	195	326	386
1500-1600	404	202	67	101	202	202	328	402
1600-1700	417	215	70	105	209	209	330	416
1700-1800	431	229	72	108	215	215	332	431
1800-1900	444	244	74	111	222	222	333	444
1900-2000	458	259	77	115	229	229	335	458
2000-3000	570	401	95	143	285	285	363	570
3000-4000	656	531	109	164	328	328	370	656
4000-5000	NOT APPLICABLE		121	181	362	←	724	
5000-10000			158	238	475	←	950	
10000-15000			182	274	548	←	1097	
15000-20000			202	303	606	←	1211	
20000-25000			218	327	653	←	1306	
25000-30000			232	348	695	←	1389	

← Means that high-density distances do not apply for these quantities, the required distance is in the next column in direction of arrow.

⊕ Use these distances also for any aerodrome, dock, pier, jetty, river wall, sea wall, reservoir

\* Use these distances also for any retail shop; government and public buildings, church, college, chapel, school, hospital, theatre, cinema or other building where the public are accustomed to assemble; motorway; caravan site for which planning permission for this use has been granted and on which is located an occupied caravan for a total period in excess of 28 days in any one calendar year; factory; building or works used for the storage in bulk of petroleum spirit, gas, or other inflammable substances; buildings or works used for the storage and manufacture of explosives or of articles which contain explosives.

† "Footpath" includes a bridleway or other thoroughfare which is not a road, but does not include a footpath used by no more than 20 persons every 24 hours. "Lightly-used road" means a road used by more than 500 vehicles every 24 hours. "Minor road" means a road used by more than 500 vehicles every 24 hours, other than a major road. "Major road" means a road used by more than 10,000 vehicles every 24 hours. "Waterway" does not include a waterway navigated by no more than 20 persons every 24 hours.

**EXTERNAL SEPARATION DISTANCES**  
**TABLE 6**  
**HAZARD TYPE 2**

Quantity of Explosives (kg)	Some or all items being of more than 0.7 kg net mass per item			Every item being not more than 0.7 kg net mass per item		
	Footpath† + Lightly Used Road + Waterway	Minor Road† + Railway Line ⊕	Major Road† + Place of Public Resort + Buildings *	Footpath† + Lightly Used Road + Waterway	Minor Road† + Railway Line ⊕	Major Road† + Place of Public Resort + Buildings *
0.1-25	15	23	45	12	19	37
25-50	29	44	88	14	22	43
50-75	36	54	108	16	24	47
75-100	43	65	129	17	26	51
100-150	49	74	148	19	28	56
150-200	56	84	168	20	30	60
200-300	64	96	191	22	33	66
300-400	69	104	207	24	36	71
400-450	71	107	213	24	37	73
450-500	73	110	219	25	37	74
500-600	75	113	226	25	38	76
600-700	78	117	233	26	39	78
700-800	80	120	240	27	41	81
800-900	83	124	248	28	42	84
900-1000	85	128	256	29	44	87
1000-1100	86	130	259	29	44	88
1100-1200	87	131	262	30	45	89
1200-1300	89	133	266	30	45	90
1300-1400	90	135	270	30	46	91
1400-1500	91	137	274	31	46	92

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1500-1600	93	139	278	31	47	94
1600-1700	94	141	282	32	48	95
1700-1800	95	143	286	32	49	97
1800-1900	96	144	288	33	50	99
1900-2000	97	146	292	34	51	101
2000-3000	104	156	312	37	55	110
3000-4000	109	163	326	39	59	117
4000-5000	112	169	337	41	61	122
5000-10000	123	185	370	47	70	140
10000-15000	129	194	388	50	76	151
15000-20000	134	201	401	53	80	159
20000-25000	137	206	411	55	83	166
25000-30000	140	210	419	57	86	171

⊕ Use these distances also for any aerodromes, dock, pier, jetty, river wall, sea wall, reservoir.

\*Use these distances also for any retail shop; government and public buildings, church, college, chapel, school, hospital, theatre, cinema or other building where the public are accustomed to assemble; motorway; caravan site for which planning permission for this use has been granted and on which is located an occupied caravan for a total period in excess of 28 days in any one calendar year; factory; building or works used for the storage in bulk of petroleum spirit, gas, or other inflammable substances; buildings or works used for the storage and manufacture of explosives or of articles which contain explosives.

†Footpath includes a bridleway or other thoroughfare which is not a road, but does not include a footpath used by no more than 20 persons every 24 hours. "Lightly-used road" means a road used by more than 20 and fewer than 500 vehicles every 24 hours. "Minor road" means a road used by more than 500 vehicles every 24 hours, other than a major road. "Major road" means a road used by more than 10,000 vehicles every 24 hours. "Waterway" does not include a waterway navigated by no more than 20 persons every 24 hours.

Note For Hazard Type 2 explosives, there are no extended distances for vulnerable buildings. Apply the distances in column 4 or 7 as appropriate for such buildings.

## EXTERNAL SEPARATION DISTANCES

Quantity of Explosives (Kg)	Footpath† + Lightly Used Road† + Waterway (m)	Minor Road† + Railway Line ⊕ (m)	Major Road† + Place of Public Resort + Buildings * (m)
0.1-25	0	0	0
25-50	8	12	23
50-75	8	13	25
75-100	10	15	29
100-150	11	17	33
150-200	12	19	37
200-300	14	21	42
300-400	16	24	47
400-450	16	24	47
450-500	17	25	50
500-600	17	26	51
600-700	18	27	53
700-800	18	27	54
800-900	18	28	55
900-1000	21	32	63
1000-1100	23	35	70
1100-1200	24	36	71
1200-1300	24	36	72
1300-1400	24	37	73
1400-1500	25	37	74
1500-1600	25	38	75
1600-1700	25	38	76
1700-1800	26	39	78
1800-1900	26	40	79
1900-2000	27	40	80
2000-3000	30	41	91
3000-4000	33	50	100
4000-5000	36	54	107
5000-10000	45	68	136
10000-15000	52	78	156
15000-20000	57	86	172
20000-25000	62	93	185
25000-30000	66	100	199

Quantity of Explosives (Kg)	Footpath† + Lightly Used Road† + Waterway (m)	Minor Road† + Railway Line ⊕ (m)	Major Road† + Place of Public Resort + Buildings * (m)
0.1-250	0	0	0
250-300	1	1	1
300-340	1	1	2
340-370	1	2	3
370-400	1	2	4
400-450	2	3	5
450-500	2	3	6
500-550	2	4	7
550-650	3	4	8
650-700	3	5	10
700-750	4	6	11
750-800	4	6	12
800-900	4	7	13
900-950	5	7	14
950-1000	5	8	15
1000-1100	5	8	16
1100-1150	6	9	17
1150-1200	6	9	18
1200-1300	6	10	19
1300-1350	7	10	20
1350-1400	7	11	21
1400-1450	7	11	22
1500-1550	8	12	23
1550-1600	8	12	24
1600-1650	8	13	25
1650-1700	9	13	26
1700-1800	9	14	27
1800-1850	9	14	28
1850-1900	10	15	29
1900-2000	10	15	30
2000-3000	12	18	35
3000-4000	13	20	40
4000-5000	15	23	45
5000-10000	17	26	51
10000-15000	18	27	54
15000-20000	18	28	55
20000-25000	19	29	58
25000-30000	20	30	60

⊕ Use these distances also for any aerodromes, dock, pier, jetty, river wall, sea wall, reservoir.

\* Use these distances also for any retail shop; government and public buildings, church, college, chapel, school, hospital, theatre, cinema or other building where the public are accustomed to assemble; motorway, caravan site for which planning permission for this area had been granted and on which is located an occupied caravan for a total period in excess of 28 days in any one calendar year; factory; building or works used for the storage in bulk of petroleum spirit, gas, or other inflammable substances; buildings or works used for the storage and manufacture of explosives or of articles which contain explosives.

† "Footpath" includes a bridleway or other thoroughfare which is not a road, but does not include a footpath used by no more than 20 persons every 24 hours. "Lightly-used road" means a road used by more than 20 or fewer than 500 vehicles every 24 hours. "Minor road" means a road used by more than 500 vehicles every 24 hours, other than a major road, "Major road" means a road used by more than 10,000 vehicles every 24 hours "Waterway" does not include a waterway navigated by no more than 20 persons every 24 hours.

**Note** For Hazard Type 3 and Hazard Type 4 explosives, there are no extended distances for vulnerable buildings. Apply the distances in Column 4 of Table 7 or Table 8 as appropriate for such buildings.

**Formulae for calculating separation distances**

Type of explosive, store construction and population density	Quantity of explosive (kg)	Formula for calculating separation distances (in metres)
HT1 mounded brick store, low population density	25 - 500	$R = 0.2167 * Q + 95.9167$
	500 - 1647	$R = 204$
	1647 or more	$R = 22.4 * Q^{(1/3)} / ((1 + (3175 / Q)^2)^{(1/6)})$
HT1 mounded brick store, high population density	100 - 300 600 - 2000	$R = (73.84 * Q / (-3.364 + Q)) + (249.2 * Q / (413.1 + Q))$
	2000 or more	$R = 22.4 * Q^{(1/3)} / ((1 + (3175 / Q)^2)^{(1/6)})$
HT1 unmounded brick store	25 - 5600	$R = (93.75 * Q / (-3.492 + Q)) + (379.8 * Q / (273.8 + Q))$
	5600 - 19603	$R = 0.010388771 * Q + 397.7274671$
	19603 or more	$R = 22.4 * Q^{(1/3)} / ((1 + (3175 / Q)^2)^{(1/6)})$
HT1 mounded steel store, low population density	75 - 243	$R = 0.114666667 * Q + 31.4$
	243 or more	$R = 22.4 * Q^{(1/3)} / ((1 + (3175 / Q)^2)^{(1/6)})$
HT1 mounded steel store, high population density	75 - 300	$R = 0.138666667 * Q + 34.6$
	300 or more	$R = 22.4 * Q^{(1/3)} / ((1 + (3175 / Q)^2)^{(1/6)})$
HT1 unmounded steel store, annex removed, low population density	75 - 241	$R = 0.096 * Q + 35.8$
	241 or more	$R = 22.4 * Q^{(1/3)} / ((1 + (3175 / Q)^2)^{(1/6)})$
HT1 unmounded steel store, annex removed, high population density	75 - 450	$R = 0.229333333 * Q + 31.8$
	450 - 2255	$R = 0.060848971 * Q + 107.6179629$
	2255 or more	$R = 22.4 * Q^{(1/3)} / ((1 + (3175 / Q)^2)^{(1/6)})$

**Key:** R = radius  
 Q = quantity (in kilograms)  
 LN = logarithm

Type of explosive, store construction and population density	Quantity of explosive (kg)	Formula for calculating separation distances (in metres)
HT1 unrounded steel store with annex, low population density	75 - 450	$R = 0.205333333 * Q + 32.6$
	450 - 1917	$R = 0.067017231 * Q + 94.84224616$
	1917 or more	$R = 22.4 * Q^{(1/3)} / ((1 + (3175 / Q)^2)^{(1/6)})$
HT1 unrounded steel store with annex, high population density	75 - 450	$R = 0.661333333 * Q + 10.4$
	450 - 9922	$R = 0.017480771 * Q + 300.133653$
	9922 or more	$R = 22.4 * Q^{(1/3)} / ((1 + (3175 / Q)^2)^{(1/6)})$
HT2 (0.7 kg net mass per item or less)	-	$R = 28.127 - 2.364 * \text{LN}(Q) + 1.577 * \text{LN}(Q)^2$ ; minimum distance of 30 metres
HT2 (0.7 kg net mass per item or more)	-	$R = -167.648 + 70.345 * \text{LN}(Q) - 1.303 * \text{LN}(Q)^2$ ; minimum distance of 60 metres
HT 3	-	$R = 6.4 * Q^{(1/3)}$

**Key:** R = radius

Q = quantity (in kilograms)

LN = logarithm

