

The GB Explosives Regulatory Framework



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Objectives

- Provide an overview of the regulatory framework relating to the non-criminal use of explosives in Great Britain
- Identify how the regulatory framework for explosives is structured
- Describe the key provisions relating to the safety and security requirements for the design, manufacture, transport and storage of explosives

Glossary

- HSWA1974 - [Health and Safety at Work etc. Act 1974](#)
- ER2014 – [Explosives Regulations 2014](#)
- PASR2015 – [Pyrotechnic Articles \(Safety\) Regulations 2015](#)
- CDG2009 - [Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009](#)
- DGHAR2016 - [Dangerous Goods in Harbour Areas Regulations 2016](#)
- QR1999 – [Quarries Regulations 1999](#)
- MR2014 – [Mines Regulations 2014](#)
- CDM2015 – [Construction \(Design and Management\) Regulations 2015](#)
- MHSWR1999 - [Management of Health and Safety at Work Regulations 1999](#)
- DSEAR2002 - [Dangerous Substances and Explosive Atmospheres Regulations 2002](#)

Legislation and Guidance

- Acts
- Regulations
- Approved Code of Practice (ACoP)
- HSE Guidance
- Industry Guidance

What is an explosive?

Technical

An explosive (or explosive material) is a reactive substance that contains a great amount of potential energy that can produce an explosion if released suddenly, usually accompanied by the production of light, heat, sound, and pressure. (Wikipedia)

Legal (ER2014)

“explosive” means —

- any explosive article or explosive substance which would —
 - if packaged for transport, be classified in accordance with the United Nations Recommendations as falling within Class 1; or
 - be classified in accordance with the United Nations Recommendations as —
 - being unduly sensitive or so reactive as to be subject to spontaneous reaction and accordingly too dangerous to transport, and
 - falling within Class 1; or
- 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 or preparation in a solely gaseous form or in the form of vapour, which is —

- 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
- 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;

What is an explosive?

Legal (ER2014 continued)

“pyrotechnic article” means any article containing explosive substances or an explosive mixture of substances designed to produce heat, light, sound, gas or smoke or a combination of such effects through self-sustained exothermic chemical reactions;

“pyrotechnic substance” means an explosive 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

Legal (United Nations Model Regulations)

Class 1 comprises:

- Explosive substances (a substance which is not itself an explosive but which can form an explosive atmosphere of gas, vapour or dust is not included in Class 1), except those that are too dangerous to transport or those where the predominant hazard is appropriate to another class:
- Explosive articles except devices containing explosive substances in such quantity or of such character that their inadvertent or accidental ignition during transport shall not cause any effect to the device either by projection, fire, smoke, heat or loud noise
- Substances and articles not mentioned above which are manufactured with a view to producing a **practical** explosive or pyrotechnic effect.

Definitions – Key Learning Points

- Legal definitions are often different to the meaning of a word or phrase in common usage.
- Legal documents will contain a section or a regulation that brings together definitions of terms appearing in more than one place.
- If a defined word or phrase only appears in one section or regulation, it's definition will appear in that section or regulation.
- In ER2014 the definitions appear in regulation 2.

What is the GB legislative framework?

Principle Activity	Secondary Activity	Explosives Specific legal provisions	Supporting legal provisions	Overarching legal provisions
Acquisition	Manufacture	ER2014	MHSWR1999 DSEAR2002	HSWA 1974
	Purchase/Placing on the market	ER2014		
		PASR2015		
	Other (find)	ER2014		
Storage	N/A	ER2014		
Transport	N/A	CDG2009 (& other modes)		
		DGHAR2016		
Use	N/A	QR1999		
		MR2014		
		CDM2015		
Disposal	N/A	ER2014		
Decommissioning	N/A	ER2014	MHSWR1999 DSEAR2002 CDM2015	

From this:

Explosives Act 1875

Fireworks Act 1951 **Revoked**

Placing on the Market and Supervision of Transfers of Explosives Regulations 1993

Control of Explosives Regulations 1991

Manufacture and Storage of Explosives Regulations 2005

Health and Safety (Miscellaneous Amendments) Regulations 2004

Health and Safety (Enforcing Authority) Regulations 1998

Identification and Traceability of Explosives Regulations 2013

Marking of Plastic Explosives for Detection Regulations 1996

Health and Safety (Miscellaneous Amendments) Regulations 2009

Cert of Ex No 1 of 2001

Cert of Ex No 1 of 2010

Cert of Ex No 2 of 2010

Cert of Ex No 3 of 2010

Cert of Ex No 4 of 2010

Cert of Ex No 2 of 2011

Cert of Ex No 3 of 2011

Cert of Ex No 1 of 2012

Cert of Ex No 2 of 2012

Cert of Ex No 3 of 2012

Order in Council 26

Order of Secretary of State 11

Acetylene

The Explosives Act 1875 and 1923 etc. (Repeals and Modification) Regulations 1974

The Explosives Act 1875 and 1923 etc. (Repeals and Modification) (Amendment) Regulations 1974

Explosive Act Exemptions

The Explosives Act 1875 etc (Metrication and Miscellaneous Amendment) Regulations 1984

Covered by ER2014

ER2014

- 15 Parts, 86 Regulations (including 2 part 'A's), 18 Schedules
- **Part 1 Introduction**
- **Part 2 Authorisations**
- Part 3 Defences in relation to regulations 5 to 7
- Part 4 Applications for and Grant of Authorisations
- Part 5 Variation and transfer of authorisations to manufacture or store explosives and death, bankruptcy or incapacity of a licensed person
- Part 6 Refusals of Authorisations
- Part 8 Licences for sites which cease to be, or become, ONR regulated sites
- **Part 9 Safety of Explosives**
- **Part 10 Security of explosives: Preventing unauthorised access or acquisition**
- **Part 11 Security of explosives: Traceability, records & reporting loss**
- **Part 12 Security provisions in relation to plastic explosives**
- **Part 13 Sub-part A: Making available on the market – obligations of economic operators, Sub-part B: Conformity Assessment bodies, Sub-part C: Notification of conformity assessment bodies**
- Part 14 Enforcement of the regulations
- Part 15 Power to grant exemptions and miscellaneous provisions

ER2014 Part 1 – Introduction – Key provisions

Regulation 2 - Interpretation

“manufacture” includes—

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

but it does not include the packing, unpacking, re-packing, labelling or 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

“storage” in relation to explosives means their possession for any period after their manufacture, save for—

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

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 is to be treated as storage within the meaning of these Regulations and the provisions of these Regulations apply to that keeping accordingly, notwithstanding any application of the provisions of the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 to that transporting.

ER2014 Part 1 – Introduction – Key provisions

Regulation 3 – Application and Extent

Principally provide partial or complete exemptions to the requirement to comply with permissioning requirements and separation distances to:

- The Crown;
- Explosives under the control of the Ministry of Defence
- The Police
- Customs
- Enforcing Authorities
- Explosives being transported

There are NO exemptions to regulation 26 (Fire and Explosion Measures) or to the security provisions (Parts 10, 11 & 12) where explosives are being manufactured and/or stored!

ER2014 Part 2 - Authorisations - Why do you need licences & other permissions under ER2014?

- [STATEMENT OF PURPOSE' FOR HSE's EXPLOSIVES LICENSING REGIME](#)
- The worldwide history of the explosives sector includes numerous sudden, often unexpected and incompletely explained catastrophic incidents.
- Experience indicates that the inherent properties of explosives mean that it is often difficult or impossible to avoid an incident once an initiating event has taken place.
- HSE, along with regulators around the world, recognises that the manufacture and storage of explosives often results in high, sustained and broadly based levels of societal concern over the potential risks of harm associated with that manufacture and storage and with the associated explosives activities that can be located with them.
- This concern can be related to events associated with the manufacture and storage of explosives that have often resulted in multiple fatalities from a single event.
- For these reasons, and in line with HSE's approach set out in 'Our approach to permissioning regimes' (www.hse.gov.uk/enforce/permissioning.pdf), formal licensing by regulatory authorities of the manufacture and storage of explosives and the associated explosives activities that can be located with them, is appropriate.
- There are some people who should not have uncontrolled access to certain types of explosives.
- Regulations 6 & 7 list the limited circumstances in which a licence is not required – but do not allow you to undertake those activities if it means you would breach the conditions of your licence

ER2014 Part 2 – Authorisations – What does a licence cover?

All licences detail:

- the site and, within it, the places where the explosives may be stored, or, in the case of a licence to manufacture explosives, where they may be manufactured;
- the hazard type, if any, the description and maximum amount of explosives which may be—
 - stored or otherwise present, or
 - in the case of licence to manufacture explosives, manufactured,

HSE & ONR licences also include:

- conditions relating to separation distances
- conditions relating to:
 - Construction, siting and orientation of buildings and protective works where activities are going on.
 - The activities (and uses) that can be undertaken in buildings, rooms and places.
- potentially conditions relating to ingredients, flammable and otherwise dangerous materials as well as transport, use and testing of explosives on the licensed site

ER2014 Part 9 – Safety of Explosives – Fire and Explosion Measures

- Goal setting provision focusing on three duties that **anyone** manufacturing or storing explosives has:
 - Stop a fire or explosion from happening
 - Put arrangements in place to prevent spread of fire and communication of explosions
 - Protect people from the effects of fire and explosions
- ‘Appropriate’ generally taken to mean So Far As is Reasonably Practicable/As Low As Reasonably Practicable
- Manufacture and storage includes any handling, onsite transport and testing associated with the manufacture and storage
- References to fire and explosion relates to unplanned event
 - A planned event can be considered to be unplanned if it had a more extensive effect than was expected

Reasonable Practicability

- Key principle of Sections 2 and 3 of HSWA
 - It shall be the duty of every employer to ensure, so far as is reasonably practicable, the health, safety and welfare at work of all his employees.
 - It shall be the duty of every employer to conduct his undertaking in such a way as to ensure, so far as is reasonably practicable, that persons not in his employment who may be affected thereby are not thereby exposed to risks to their health or safety.
- Edwards v. The National Coal Board
 - In this case, the Court of Appeal considered whether or not it was reasonably practicable to make the roof and sides of a road in a mine secure.
- Concept of gross disproportionality



ER2014 Part 9 – Safety of Explosives – Separation Distances

- Mandatory to use the tables in schedule 5 for all storage unless disapplied (including storage not requiring a licence e.g. unlimited HT3 for 24 hours!)
- Separation distances don't apply to desensitised explosives, non-fixed rules sites licensed by HSE & ONR (HSE & ONR's power to require separation distances mainly comes from regulation 13 (6)) or MOD explosives subject to the Secretary of States Scheme (DSA03 OME Part 2/JSP482).
- Identifies materials that separation distances don't apply to where they are all that is present on a site e.g.
 - up to 100g
 - 5kg combination of shooters powder and model rockets
 - 30kg of shooters powder and 300g of percussion caps
 - 200 detonators and 5kg of water based explosives and/or detonators
 - Limited quantities of explosives for police use

Provided they are stored 'in a safe and suitable place with all due precaution for public safety

- They are separation distances NOT safety distances

ER2014 Part 9 – Safety of Explosives – Separation Distances

- Tables, aggregation rules and definitions of protected places appear at Schedule 5 of ER2014
- Distances driven by Hazard Type and whether building is metal, brick or mounded.
- Derived from historical incident data and tests
- HSE guidance on how to interpret building structures - [HSE Explosives - Building and construction type - Hazard Type 1](#)
- Hazard Type is analogous to UN Hazard Division but recognises that:
 - the quantity of explosives
 - the types of explosives
 - the loading density
 - packaging (if any) or containment
 - the presence of barriers or other controls that will prevent rapid communication of an event between explosives
 - orientation
 - how an event involving the explosives might progress or degrade any controlscan affect hazard.

ER2014 Part 9 – Safety of Explosives – Separation Distances

Hazard Type 1 (HT1)

- 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 (HT2)

- 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 (HT3)

- 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

Hazard Type 4 (HT4)

- 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

ER2014 Part 9 – Safety of Explosives – Regulation 28 – Discarding or disposing of explosives and decontamination of explosive contaminated items

- General duty to discard or dispose of explosives or explosively contaminated items SFARP safely
- Disposes defined in regulation 2 (1) i.e.
 - in relation to explosives and explosive-contaminated items, means destroying the explosives or explosive-contaminated items or otherwise rendering them harmless.
- Discard and decontaminates are not defined.

(SFARP – So Far As is Reasonably Practicable)

ER2014 Part 9 – Safety of Explosives – Regulation 29 Prohibitions concerning manufacture, storage and importation of certain explosives

- Prohibits the manufacture, storage or import into the United Kingdom of pyrotechnics substances and/or articles containing admixtures of sulphur or phosphorous with chlorates without the approval of HSE.
- Identifies what HSE needs to consider before providing its approval i.e.
 - the risk of the mixture spontaneously combusting; and
 - the potential for the mixture to become sensitive to ignition by friction or impact
- There is NO exemption for MOD

Part 10 Security of explosives – Regulation 30 – Unauthorised access

- Goal setting provision requiring appropriate precautions for preventing unauthorised persons having access to:
 - the places where those explosives are manufactured, stored or kept; or
 - the explosives.
- Prohibits people from entering:
 - any store within a site;
 - any building used for the manufacture of explosives within a site, or
 - any site, or any place within it, with clearly marked boundaries at which explosives are stored or manufactured, operating under a licence; or
- Also prohibits people refusing to leave that site when requested to do so by a constable or the licensee.
- Allows the use of reasonable force by the police and/or licensee to remove people
- Includes:
 - climbing onto the roof in the definition of entering; and
 - extends the power to remove to the licensee's employees or their agent

Part 10 Security of explosives – Regulation 31 - Prohibitions concerning the transfer of relevant explosives

- prohibits the transfer of relevant explosives to people who don't have an explosives certificate unless:
 - The explosives are being exported
 - The explosives are going to NI and the PSNI has issued an approval
 - The explosives are going to an off-shore installation
 - The transferee doesn't require an explosives certificate under regulation 3 (7)
- brings agents into scope as transferors
- provides exemptions for people in the transport chain
- limits the scope of the exemption for export to ER2014

Part 10 Security of explosives – Regulation 32 - Restrictions on prohibited persons

- Prohibit employers from employing prohibited persons in positions where they handle or has control of any relevant explosive or any restricted substance.
- Prohibit a prohibited person from acquiring, handling or having control of any relevant explosive or any restricted substance, even if they would meet the requirements for being issued with an explosives certificate.
- Provides an exemption for members of the armed forces
- Restricted substances are defined in regulation 2 (1) as ‘...any collection of substances which would if mixed form one or more explosive substances and which has been prepared for that purpose

ER2014 - Part 11 Security of explosives: Traceability, records & reporting loss - Regulation 33 – Unique identification of civil explosives

- Manufacturer's must as soon as reasonably practicable mark, label or tag **civil explosives** and it must be done before the explosives have been moved away from the site of manufacture
- The mark must follow a specific format and be durable and legible.
- There is an exemption for explosives manufactured for export where they are marked in accordance with the receiving states requirements.
- Where explosives are reprocessed they only need to be remarked where the original marking is no longer valid
- Imports need to be marked when they arrive in GB or come in marked
- Distributors need to ensure repackaged explosives remain compliant.
- “civil explosive” means an explosive which has been or would be classified in accordance with the United Nations Recommendations as falling within Class 1 but it does not include—
 - ammunition the acquisition of which is regulated or prohibited by virtue of the Firearms Acts 1968 to 1997
 - any explosive which it is shown is intended for lawful use by the armed forces or the police of any country(c)
 - a pyrotechnic article

ER2014 - Part 11 Security of explosives: Traceability, records & reporting loss - Regulation 34 – Attribution of manufacturing site codes for civil explosives

- Identifies HSE as the GB organisation for attribution of site codes for manufacturing sites for explosives that are:
 - manufactured in GB
 - imported into the UK
- Provides a framework on who to apply to depending on where the explosives have been manufactured and where in the **UK** they are going to.
- Quite a complex structure – needs to be read in context of schedule 6 which permits EEA site codes

ER2014 - Part 11 Security of explosives: Traceability, records & reporting loss - Regulation 35 – Records in relation to relevant explosives

- Provides a framework for the generation and retention of records of relevant explosives – NO exemption for MOD.
- Does not apply when the relevant explosive is a civil explosive because that should be marked.
- Requires the following information to be recorded:
 - type;
 - manufacturer;
 - description and name, product code or other information which enables the relevant explosive to be distinguished;
 - the total number of any explosive articles or cartridged substances, the total nominal mass of explosive substance not contained in explosive articles
 - the location of the relevant explosive
 - the name and address of any person to whom the relevant explosive is transferred; and
 - Whether the relevant explosive has been—
 - subjected to a further manufacturing process after its acquisition;
 - used;
 - transferred to another person; or
 - destroyed,and the date of any such further manufacturing process, use, transfer or destruction.
- Requires the system to be periodically tested i.e. audits and stock checks
- End use by private individuals for non-work purposes is exempted from the record keeping requirements
- ‘Site-mixed’ explosives are also exempt

ER2014 - Part 11 Security of explosives: Traceability, records & reporting loss - Regulation 36 – Records in relation to civil explosives

- Provides a framework for the generation and retention of records of civil explosives.
- Requires the following information to be recorded:
 - type;
 - unique identification
 - the location of the civil explosive
 - the name and address of any person to whom the civil explosive is transferred; and
 - Whether the civil explosive has been—
 - subjected to a further manufacturing process after its acquisition;
 - used;
 - transferred to another person; or
 - destroyed,and the date of any such further manufacturing process, use, transfer or destruction.
- Requires the system to be periodically tested i.e. audits and stock checks
- End use by private individuals for non-work purposes is exempted from the record keeping requirements
- ‘Site-mixed’ explosives are also exempt

ER2014 - Part 11 Security of explosives: Traceability, records & reporting loss - Regulation 37 – Reporting Loss

- Requires losses of **relevant** explosives to be reported to the police. There is **NO** exemption for MOD
- Provides the format for what a report should contain
- Requires losses on HSE and ONR licensed sites to be reported to the licensing authority
- Requires systems to be in place to detect losses and those systems to be tested
- Places duties on people throughout the life-cycle of an explosive
- Don't need to report losses of relevant explosives where it can be shown that the cause was not theft and that the relevant explosive no longer exists.

ER2014 - Part 12 – Security provisions in relation to plastic explosives - Regulation 38 – Prohibitions in relation to unmarked plastic explosive

- Prohibits the import, manufacture, possession or transfer of possession of unmarked plastic explosives unless the plastic explosive is in the process of being manufactured
 - Defines a plastic explosive in terms of:
 - vapour pressure of the explosive component
 - formulation
 - physical characteristics
 - Exempts explosives:
 - the manufacture or possession of which is to a quantity no greater than is necessary for the purpose of, and is solely for use in, lawful research, development or testing of new or modified explosives;
 - the manufacture or possession of which is to a quantity no greater than is necessary for the purpose of, and is solely for use in, lawful training in explosives detection or development or testing of explosives detection equipment; or
 - the manufacture or possession of which is to a quantity no greater than is necessary for, and is solely for, the purpose of lawful forensic science.
- from the definition of plastic explosives
- Lists the marking agents that can be used and their minimum concentrations at the time of manufacture

ER2014 - Part 13 Making available on the market – Civil Explosives

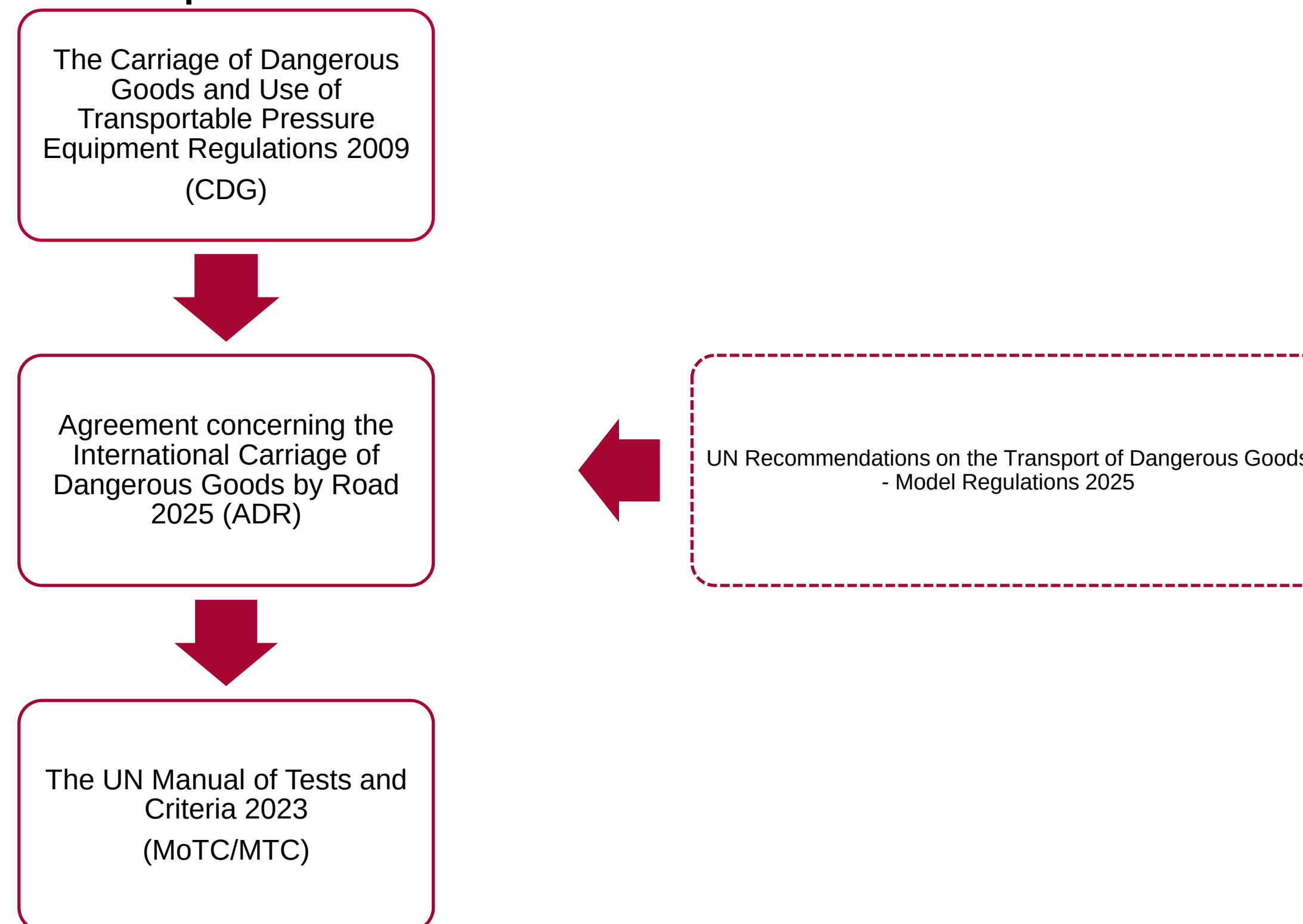
- Requires explosives that are first placed on the market and made available on the market to meet defined (high level) essential safety requirements.
- Describes the duties of people in the supply chain.
- Requires manufacturers or importers to subject civil explosives to Type Approval by a conformity assessment body and to have arrangements in place to ensure that future production complies with the type approval
- Type approval can be undertaken against harmonised/recognised CEN standards that detail the requirements for individual products
- PASR2015 has a similar framework for pyrotechnic articles (but also includes requirements on categorising the use hazards and requirements for specialist knowledge before pyrotechnic articles are supplied and GB restrictions on the supply of certain types of fireworks to the public.)

Transport - DGHAR2016

- Contains a set of safety provisions aimed at safeguarding ports against major accidents involving dangerous goods when they transit through ports, harbours and harbour areas.
- The definition of dangerous substance in DGHAR is based on that of the [International Maritime Organisation's International Maritime Dangerous Goods Code \(IMDG Code\)](#).
- With limited exemptions harbour areas where explosives (other than UN 1.4) are to be brought in or handled must be licensed by HSE or, in certain cases, the Office for Nuclear Regulation (ONR). This also applies to any loading or unloading of explosives on the coast of Great Britain or in territorial waters. There **IS** an exemption for explosives under the control of MOD
- Introduces associated safety and security requirements for explosives in harbour areas:
 - Berth operators and harbour authorities and others in charge of explosives must take effective measures to safeguard explosives against damage, theft, loss and wrongful use.
 - Vehicles loaded with explosives must be taken out of harbour areas as soon as reasonably practicable.
 - Harbour craft carrying explosives must not carry passengers at the same time, with certain exceptions.
 - Anyone with custody of explosives must report any deterioration or change in the explosives to the harbour master or berth operator, who must agree suitable precautions for their handling.
 - With certain exceptions for fireworks the harbour authority must keep records of all explosives handled, loaded or unloaded in its harbour area for three years. For explosives loaded or unloaded outside a harbour area, the licensee should keep the records.

Transport - CDG2009 - Requirements

CDG2009 – Regulation 5 - “No person is to carry dangerous goods, or cause or permit dangerous goods to be carried, where that carriage is prohibited by ADR or RID, including where that carriage does not comply with any applicable requirement of ADR or RID”



Transport - CDG2009 – Classification of Explosives – GB Roles

- CDG2009 requires the classification of explosives to have been undertaken by the Competent Authority of a contracting party to ADR before those explosives are consigned for carriage.
- A Competent Authority is a body designated or recognised to carry out duties under transport of dangerous goods regulations.
- In Great Britain:
 - HSE is the Competent Authority for the classification and fulfilment of other competent authority functions relating to non-military explosives
 - Military explosives, ie explosives under the control of and/or in connection with the execution of contracts for the Secretary of State for Defence are classified by the Defence Ordnance and Safety Regulator (DOSR)

Transport - CDG2009 – Classification of Explosives – HSE Tasks

As a Competent Authority, HSE:

- assigns classification of non-military explosives where a Competent Authority Document (CAD) does not exist
- recognises the classification of explosives whose classification has been assigned by the Competent Authority of a country that is not a Contracting Party to ADR (such as the USA)
- issues a CAD, which records the classification granted, and any appropriate conditions

Transport - CDG2009 – Classification of Explosives – How?

Explosives may be assigned a classification by one of the following methods:

- Fireworks
 - UN Default Table
 - Test
 - Analogy to a previously classified firework
- Explosive substances/articles
 - Test
 - Basis by analogy with a similar explosive previously classified by HSE or the Defence Ordnance and Safety Regulator (DOSR)
 - By recognising the classification assigned by the Competent Authority of a country that is not a Contracting Party to ADR.

Transport - CDG2009 – Classification of Explosives – Output

Hazard Division

- 1.1 – Mass Explosion
- 1.2 – Projectile but no mass explosion hazard
- 1.3 – Fire and minor blast or projectile hazard
- 1.4 – No significant hazard
- 1.5 – Insensitive Substances having mass explosion hazard
- 1.6 – Insensitive Articles with no mass explosion hazard

Compatibility Group

- A,B,C,D,E,F,G,H,J,K,L,N,S.
- Letters refer to different explosives types or configurations.
- Used to determine which explosives may be transported together as a mixed load.

UN Number & Proper Shipping Name

- Security requirements
- Special Provisions
- Information for first responders

Transport - CDG2009 – Classification of Explosives – Why is testing important?



Transport - CDG2009 – Classification of Explosives – Why is testing important?



Transport - CDG2009 – Classification of Explosives – Why is testing important?



Transport - CDG2009 – Classification of Explosives – Why we don't default to 1.1



Transport – other modes

- By Sea: International Maritime Dangerous Goods (IMDG) Code
Maritime and Coastguard Agency (MCA)
- By Rail: Regulations Concerning the International Carriage of Dangerous Goods by Rail (RID)
Office for Road and Rail (ORR)
- By Air: International Air Transport Association (IATA) International Dangerous Goods Regulations
Civil Aviation Authority (CAA)

Fireworks - Enschede



Fireworks



Fireworks



This movie shows a large scale trial where a 20 ft ISO container was completely filled with waterfalls (8661 kg NEQ).



Key Provisions – Risk Assessment – MHSWR1999

Regulation 3(1) - Every employer shall make a suitable and sufficient assessment of—

- the risks to the health and safety of his employees to which they are exposed whilst they are at work; and
- the risks to the health and safety of persons not in his employment arising out of or in connection with the conduct by him of his undertaking

Regulation 5(1) - Every employer shall make and give effect to such arrangements as are appropriate, having regard to the nature of his activities and the size of his undertaking, for the effective planning, organisation, control, monitoring and review of the preventive and protective measures.

[Managing health and safety - HSE](#)

Key Provisions – Risk Assessment – DSEAR2002

Regulation 5 (1) Where a dangerous substance is or is liable to be present at the workplace, the employer shall make a suitable and sufficient assessment of the risks to his employees which arise from that substance.

Regulation 5(2) The risk assessment shall include consideration of—

- **the hazardous properties of the substance;**
- information on safety provided by the supplier, including information contained in any relevant safety data sheet;
- **the circumstances of the work including—**
 - **the work processes and substances used and their possible interactions;**
 - **the amount of the substance involved;**
 - **where the work will involve more than one dangerous substance, the risk presented by such substances in combination; and**
 - **the arrangements for the safe handling, storage and transport of dangerous substances and of waste containing dangerous substances;**
- **activities, such as maintenance, where there is the potential for a high level of risk;**
- the effect of measures which have been or will be taken pursuant to these Regulations;
- the likelihood that an explosive atmosphere will occur and its persistence;
- **the likelihood that ignition sources, including electrostatic discharges, will be present and become active and effective;**
- **the scale of the anticipated effects of a fire or an explosion;**
- **any places which are or can be connected via openings to places in which explosive atmospheres may occur; and**
- such additional safety information as the employer may need in order to complete the risk assessment.

Sources of Ignition

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

Testing of Control Measures

- 1) Elimination
- 2) Substitution
- 3) Engineering controls
- 4) Administrative controls
- 5) Personal protective clothes and equipment

HSE & Government Guidance

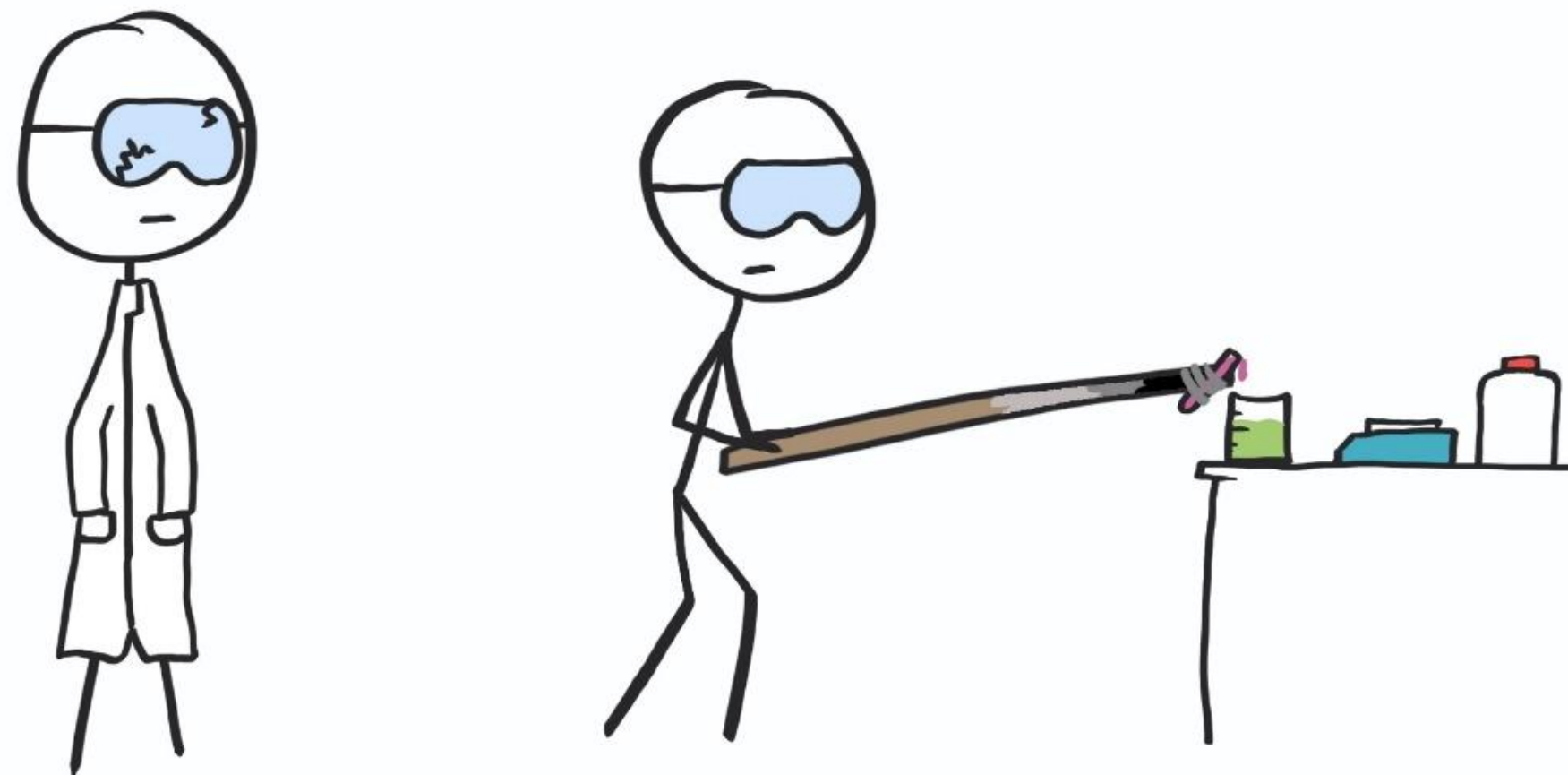
- [HSE Explosives - Getting started](#)
- [Explosives Regulations 2014: Guidance on Regulations – Safety provisions L150 \(hse.gov.uk\)](#)
- [Explosives Regulations 2014: Guidance on Regulations - Security provisions L151 \(hse.gov.uk\)](#)
- [Explosives Regulations 2014 - Subsector guidance \(hse.gov.uk\)](#)
- [Health and Safety Executive Explosives Licensing Handbook - Part 1 Licences Granted Under the Explosives Regulations 2014 regulation 13 other than 'Fixed Rule' and 'On-site mixing' licences \(hse.gov.uk\)](#)
- explosive.enquiries@hse.gov.uk
- [Dangerous Goods in Harbour Areas Regulations 2016 \(hse.gov.uk\)](#)
- [DSA03 OME part 2 \(JSP482\)](#)

Industry Guidance

- [Guidance-for-the-Safe-Management-and-Disposal-of-Explosives-v2.1](#)
- [EIG Structural Justification-Edition 2](#)
- [Requirements For Remote Explosives Manufacturing Facilities](#)
- [Guidance For Electrical Installation And Equipment Within Explosives Manufacturing And Storage Facilities](#)
- [Guidance on Fire Precautions at Explosives Sites Licensed by the Health & Safety Executive](#)
- [EIG Guide to CDG 2009](#)

Questions?

A GOOD DAY IN THE LAB
IS ANY DAY
NOTHING EXPLODES



*UNLESS YOU WORK IN AN EXPLODING THINGS LAB, IN
WHICH CASE PLEASE BLOW UP THIS INACCURATE CARTOON

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