

Technical Fire Safety Central Support

Guidance note for the use of the Dangerous Substance and Explosive Atmosphere Regulations 2002

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South Yorkshire
Fire & Rescue
WORKING FOR A SAFER
SOUTH YORKSHIRE

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1. Introduction

1.1 The purpose of this Guidance Note is to advise petroleum storage sites and other organisations who store or keep petrol in cans and drums, for use in internal combustion engines, of their duties under DSEAR.

1.2 DSEAR came into force on 09 December 2002. Petrol storage and use at these sites will be controlled by DSEAR and the enforcement of the DSEAR will be undertaken by this Fire Authority enforcing the Health & Safety at Work etc Act 1974 in accordance with the Petroleum Consolidation Act 2014 (PCA14), and approved codes of practice. The petrol-certification regime applies to petrol filling stations where petrol is dispensed from a pump into the fuel tanks of vehicles and certain other storage facilities.

2. Main Requirements of DSEAR

2.1 Employers and the self-employed must:

- Carry out a risk assessment of any work activities involving dangerous substances
- Provide technical and organisational measures to eliminate or reduce to as far as is reasonably practicable the identified risks
- Provide equipment and procedures to deal with accident and emergencies
- Provide information and training to employees

2.1 Overall, DSEAR can be seen to be an expansion of the general duty to manage risks under the Management of Health and Safety at Work Regulations 1999; making explicit good practices for reducing the risk to persons from fires, explosions and similar energetic (energy releasing) events.

3. Scope of DSEAR

3.1 Other than for certain maritime activities, DSEAR applies whenever the following conditions have been satisfied:

- There is work being carried out by an employer or self-employed person
- A dangerous substance is present or is liable to be present at the workplace
- The dangerous substance presents a risk to the safety of employees who may be affected by the work carried out.

- Certain parts of DSEAR relating to zoning and shared workplaces have a narrower scope as defined in regulation 3 and do not, for example, apply to the offshore sector

3.2 The definition of workplace is very wide and means any premises or part of premises used for work. Premises include all industrial and commercial premises; land-based and offshore installations as well as vehicles and vessels. Common parts of shared buildings; private roads; paths on industrial estates; and business parks are also "premises"; as are houses and other domestic dwellings. If there is a work activity in "premises" as defined above then it is a workplace for DSEAR purposes.

4. Dangerous Substances.

4.1 DSEAR applies to any substance or preparation (mixture of substances) with the potential to create a risk to persons from energetic (energy-releasing) events such as fires, explosions, thermal runaway from exothermic reactions etc. Such substances, which are known in DSEAR as dangerous substances include:

- Petrol
- Liquefied petroleum gas (LPG)
- Paints and varnishes
- Types of combustible and explosive dusts produced in (for example) machining and sanding operations.

4.2 It should be noted that many of these substances would also create a health risk as well. For example, many solvents are toxic as well as being flammable. DSEAR does not address these health risks. These are dealt with by the Control of Substances Hazardous to Health Regulations (COSHH).

DSEAR is concerned with harmful physical effects arising from thermal radiation (burns), over-pressure effects (blast injuries), and oxygen depletion effects (asphyxiation).

5. Industries Affected

5.1 The following examples illustrate the type of activities and substances commonly found at work that are likely to be covered by the new regulations:

- Storage of petrol as a fuel for cars, motor boats, horticultural machinery, or
- Construction equipment

- Use of flammable gases, such as acetylene, for welding
- Handling and storage of combustible dusts in a range of manufacturing industries, including food, wood working and animal feed industries
- Handling and storage of flammable wastes including fuel oils
- Hot work on tanks or drums that have contained flammable material
- Work activities that could release naturally occurring methane
- Filling, storage and handling of aerosols with flammable propellants, such as LPG
- Transport of flammable liquids in containers around the workplace
- Deliveries from road tankers, such as petrol into underground tanks.

6. Persons Protected

6.1 DSEAR is intended to protect not only employees at the workplace, but also any other person whether at work or not who may be put at risk by dangerous substances. This includes employees working for other employers, visitors to the site, members of the public, etc. However, when considering arrangements to deal with accidents, incidents and emergencies; and the provision of information, instruction and training, employers only have duties to persons who are at their workplace and are at risk.

7. Risk Assessment

7.1 DSEAR requires employers (or self-employed persons) to:

- a. Carry out a risk assessment before commencing any new work activity involving dangerous substances. Since the 30 June 2003 this assessment will also need to take into account the likelihood of hazardous explosive atmospheres occurring, and the need for classifying areas where such atmospheres could present a risk to health and safety.
- b. In the case of an employer with 5 or more employees, to record the significant findings of the assessment as soon as is practicable after that assessment is made, including the measures technical and organisational) taken to eliminate and/or reduce risk;
 - Sufficient information to show that the workplace and work equipment will be safe during operation and maintenance including from 30 June 2003:
 - Details of any areas zoned as hazardous due to the presence of explosive atmospheres

- c Where employers share a workplace, any special measures to ensure co-ordination of safety requirements to protect workers from explosive atmospheres
- d Arrangements to deal with accidents, incidents and emergencies; measures taken to inform, instruct and train employees.

7.2 The risk assessment required by DSEAR is an identification and careful examination of the dangerous substances present in the workplace, the work activities involving those substances and how they might fail dangerously so as to give rise to fire, explosion and similar events with the potential to harm employees and the public. Its purpose is to enable employers to decide what they need to do to eliminate or reduce to as far as is reasonably practicable the safety risks from dangerous substances.

7.3 The risk assessment is required to be carried out before commencing any new work activity and recorded as soon as is practicable. DSEAR also requires that the measures required to be recorded in the risk assessment be implemented before the work commences.

8. Safety Measures

8.1 Employers are required to ensure that the safety risks from dangerous substances are either eliminated or reduced to as far as is reasonably practicable. Where it is not possible, employers are required to take, so far as is reasonably practicable, measures to control risks and to mitigate the detrimental effects of a fire or explosion or similar event.

8.2 DSEAR, therefore, reflects the well-understood safety hierarchy of: -

- Elimination
- Control
- Mitigation

8.3 Elimination is the best solution and involves replacing a dangerous substance with a substance or process that totally eliminates the risk. In practice this is difficult to achieve and it more likely that it will be possible to replace the dangerous substance with one that is less hazardous (e.g. a high flash point solvent for a low

flash point one); or to design the process so that it is less dangerous by for example reducing quantities of substances in the process (known as process intensification¹). However, care must be taken whilst carrying out these steps so as to ensure that no other new safety or health risks are created or increased.

9. Control Measures

9.1 DSEAR requires that control measures are applied in order of priority, consistent with the risk assessment and appropriate to the nature of the activity or operation: -

- Reduce the quantity of dangerous substances to a minimum
- Avoid or minimise releases
- Control of releases at source
- Prevention of the formation of an explosive atmosphere
- Collect, contain and remove any releases to a safe place (e.g. by ventilation)
- Avoid ignition sources
- Avoid adverse conditions (e.g. temperature or control parameters) that could lead to danger
- Segregate incompatible substances

10. Mitigation

10.1 DSEAR requires that mitigation measures consistent with the risk assessment and appropriate to the nature of the activity or operation be applied including:

- Reducing the numbers of employees exposed to a minimum
- Avoid the propagation of fires or explosions
- Providing explosion pressure relief arrangements
- Providing explosion suppression equipment
- Provide plant which is constructed so as to withstand the pressure likely to be produced by an explosion
- Providing suitable Personal Protective Equipment (PPE)

10.2 DSEAR also specifies that the measures taken to achieve the elimination or the reduction of risk should include: -

- Design, construction and maintenance of the workplace (e.g. fire-resistance, explosion relief)
- Design, assembly, construction, installation, provision, use and maintenance of suitable work processes (the hardware aspects) work processes include:

plant, machinery, control systems, equipment, protective systems, connecting devices, materials, and warning, supervisory and communication systems

- Equipment and protective systems with certain design features relating to: power failure, manual over-ride (where safe to do so), energy dissipation on emergency shutdown, and preventing confusion between connecting devices
- Written instructions, permits to work and other procedural systems of organising work
- identification² of hazardous contents of containers and pipes

11. Places Where Explosive Atmospheres Can Occur

11.1 Subject to certain exceptions ³, additional requirements relating to the presence of explosive atmospheres in workplaces will come into effect after 30 June 2003. After that date, the following measures will be required at new workplaces where explosive atmospheres may be present:

- Areas where explosive atmospheres may be present are classified into hazardous zones based on an assessment of risks
- Present are classified into hazardous zones based on an assessment of risks
- Areas which are classified into hazardous zones are protected from sources of ignition by selecting equipment and protective systems on the basis of the requirements of the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 1996;
- Where necessary, areas classified as hazardous are marked with an 'EX' specified sign.
- Employees are provided with appropriate clothing that does not give rise to electrostatic discharges in zoned areas;
- Before coming into operation for the first time workplaces where hazardous areas are present are verified as meeting the requirements of DSEAR by a person competent in the field of explosion protection.

11.2 Employers must ensure that verification is carried out by someone who is competent to consider the risks at the workplace and decide on the adequacy of the control and other measures to ensure explosion safety. The competent person can be an individual person or a competent body of persons corporate or incorporate.

11.3 DSEAR requires, whenever the risk is more than slight, that employers make arrangements to protect employees (and others who are at the workplace) in the event of accidents etc. The provisions are based on existing requirements in Regulation 8 of the Management Regulations and require employers to make arrangements including:

- Suitable warning (including visual and audible alarms) and communication systems
- Escape facilities, if required by the risk assessment
- Emergency procedures to be followed in the event of an emergency
- Equipment and clothing for essential personnel dealing with the incident
- Practice drills; and
- Making information on the emergency procedures available to employees and the emergency services.

11.4 Guidance to the regulations will advise employers that they should at least contact the emergency services to advise that the information is available.

These requirements are intended to clarify what already needs to be done in relation to the safety management of dangerous substances and will not require any duties in addition to those already present in existing legislation.

12. Information Instruction and Training

12.1 Employers are required to provide employees and other people at the workplace who may be at risk with: -

- Suitable information, instruction and training on precautions and actions to be taken by employees to safeguard themselves and others
- Name of the substance and risk it presents
- Access to any relevant safety data sheet;
- Details of legislation that applies to the hazardous properties of those substances; and ;
- The significant findings of the risk assessment

Much of this is already required by existing health and safety legislation.

13. Enforcement of DSEAR

13.1 Enforcement of DSEAR in petroleum storage facilities in South Yorkshire will be by South Yorkshire Fire and Rescue as the Petroleum Enforcement Authority (PEA) at retail and non-retail petrol filling stations but only in respect of the storage and dispensing of automotive fuels; e.g. petrol and LPG.

14. References

¹ See HSE publication '7 Steps to successful substitution of hazardous substances' and the DTI Guide on Process Intensification.

² Many pipes/containers will already be marked or labelled under existing EC legislation e.g. the Supply Directives implemented in GB through the CHIP Regulations, and that would satisfy this requirement. For those that are not, 'identification' could include training, information, or verbal instruction, but in some cases may require labelling or marking or warning signs.

³ The exceptions are for: areas used for and during medical treatment of patients, use of gas appliances for cooking, hot water production, refrigeration, lighting or washing; the manufacture, handling use, storage and transport of explosives or chemically unstable substances and activities at Mines, Quarries and Offshore Installations

A complete version of DSEAR can be found on the Internet at the following address:

<http://www.hse.gov.uk/fireandexplosion/dsear.htm>

STATUTORY INSTRUMENTS

2002 No. 2776

HEALTH AND SAFETY

The Dangerous Substances and Explosive Atmospheres Regulations 2002

<i>Made</i>	<i>7th November 2002</i>
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<i>Coming into force</i>	
<i>All regulations except for regulations 5(4)(c), 7, 11, 15(2), 16(2) and 17(1) to (3)</i>	<u>9th December 2002</u>
<i>Regulations 15(2) and 16(2)</i>	<i>5th May 2003</i>
<i>Regulations 5(4)(c), 7, 11 and 17(1) to (3)</i>	<i>30th June 2003</i>

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