OakTree Management & Training Ltd

Health & Safety

DSEAR

Dangerous Substances and Explosive Atmospheres Regulations 2020

Course Objectives

The Dangerous Substances and Explosive Atmospheres Regulations.

- Background
- When does DSEAR apply?
- Where does DSEAR apply?
- What are dangerous substances?
- What does DSEAR require?
- Where can I find further information?

Introduction

The primary legislation applying to the control of substances that can cause fires and explosions in the workplace is the Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) (SI 2002 No.2776).

DSEAR requires employers to assess the risks of fires and explosions that may be caused by dangerous substances in the workplace. These risks must then be eliminated or reduced as far as is reasonably practicable. The aim is to protect employees and other people who may be put at risk, such as visitors to the workplace and members of the public.

The Regulations complement the requirement to manage risks under the Management of Health and Safety at Work Regulations 1999 (SI 1999 No 3242).

- Management of Health and Safety at Work Regulations 1999 DSEAR put into effect requirements from two European Directives: the **Chemical Agents Directive (98/24/EC) and the Explosive Atmospheres Directive (99/92/EC). It also replaced a number of older regulations dealing with flammable substances safety.**
- Chemical Agents Directive
- Explosive Atmospheres Directive

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When does DSEAR apply?

Apart from certain activities involving ships, DSEAR applies whenever:

- 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 could be a risk to the safety of people as a result of fires, explosions or similar energetic events.

Fires and explosions create harmful physical effects - thermal radiation, overpressure effects and oxygen depletion. These effects can also be caused by other energetic events such as runaway exothermic reactions involving chemicals or decomposition of unstable substances such as peroxides. These events are also covered by DSEAR.

The following examples illustrate the type of activities covered by DSEAR:

- storage of petrol as a fuel for cars, boats or horticultural machinery;
- use of flammable gases, such as acetylene, for welding;
- handling and storage of waste dusts in a range of manufacturing industries;
- handling and storage of flammable wastes such as fuel oils;
- welding or other 'hot work' on tanks and drums that have contained flammable material;
- work that could release naturally occurring flammable substances such as methane in coalmines or at landfill sites;
- use of flammable solvents in laboratories;
- storage and display of flammable goods, such as paints, in shops;
- filling, storing and handling aerosols with flammable propellants such as LPG;
- transporting flammable substances in containers around a workplace;
- deliveries from road tankers, such as petrol and bulk powders;
- chemical manufacturing, processing and warehousing;
- the petrochemical industry, both onshore and offshore.

DSEAR applies to workplaces where dangerous substances are present, used, or produced. Workplaces are any premises or parts of premises used for work. This includes places such as industrial and commercial premises, land-based and offshore installations, mines and quarries, construction sites, vehicles and vessels, etc. Places such as the common parts of shared buildings, private roads and paths on industrial estates and road works on public roads are also premises – as are houses and other domestic premises, if people are at work there. Some requirements of DSEAR which deal specifically with explosive atmospheres, do not apply to industries such as mining and offshore oil and gas production.

Explosive atmospheres and ATEX

What are dangerous substances?

Dangerous substances are substances or mixtures of substances (called 'preparations' in DSEAR) that could create risks to people's safety from fires and explosions or similar events, such as 'thermal runaway' from chemical reactions. Liquids, gases, vapours and dusts that may be found in a workplace can all be dangerous substances.

Dangerous substances include:

- substances or mixtures of substances classified as explosive, oxidising, extremely flammable, highly flammable, or flammable under the current CHIP Regulations. Many dangerous substances are listed in the Approved Supply List – Information approved for the classification and labelling of substances dangerous for supply (part of the CHIP package).
- any kind of dust that when spread in air to form a cloud (ie form an explosive atmosphere), can explode.
- any other substances, or mixtures of substances, which because of their physical properties and the way in which they are present in the workplace create a risk to safety from fires and explosions, but which may not be covered by CHIP. For example high flashpoint liquids present in the workplace at elevated temperatures.

Many of these substances can also create health risks, for example, they may be toxic or an irritant. These kinds of risks are covered under separate health law such as the Control of Substances Hazardous to Health Regulations (COSHH). It is important to consider both safety and health issues when looking at risks from substances in the workplace.

What does DSEAR require?

DSEAR places duties on employers (and the self-employed, who are considered employers for the purposes of the Regulations) to assess and eliminate or reduce risks from dangerous substances. Complying with DSEAR involves:

Assessing risks

Before work is carried out, employers must assess the fire and explosion risks that may be caused by dangerous substances. This should be an identification and careful examination of:

- the dangerous substances in the workplace.
- the work activities involving those substances; and
- the ways in which those substances and work activities could harm people.

The purpose is to help employers to decide what they need to do to eliminate or reduce the risks from dangerous substances. If there is no risk to safety from fires and explosions, or the risk is trivial, no further action is needed. If there are risks, then employers must consider what else needs to be done to comply fully with the requirements of DSEAR. If an employer has five or more employees, the employer must record the significant findings of the risk assessment.

Preventing or controlling risks

Employers must put control measures in place to eliminate risks from dangerous substances or reduce them as far as is reasonably practicable. Where it is not possible to eliminate the risk completely employers must take measures to control risks and reduce the severity (mitigate) the effects of any fire or explosion
The best solution is to eliminate the risk completely by replacing the dangerous substance with another substance or using a different work process. This is called substitution in the Regulations.

In practice this may be difficult to achieve – but it may be possible to reduce the risk by using a less dangerous substance. For example, replacing a low flashpoint liquid with a high flashpoint one. In other situations, it may not be possible to replace the dangerous substance at all. For example, it would not be practical to replace petrol with another substance at a filling station.

Control measures

Where the risk cannot be eliminated, DSEAR requires control measures to be applied in the following priority order:

- reduce the quantity of dangerous substances to a minimum;
- avoid or minimise releases of dangerous substances;
- control releases of dangerous substances at source;
- prevent the formation of a dangerous atmosphere;
- collect, contain and remove any releases to a safe place (for example, through ventilation);
- avoid ignition sources;
- avoid adverse conditions (for example, exceeding the limits of temperature or control settings) that could lead to danger;
- keep incompatible substances apart.

These control measures should be consistent with the risk assessment and appropriate to the nature of the activity or operation.

Mitigation

In addition to control measures DSEAR requires employers to put mitigation measures in place. These measures should be consistent with the risk assessment and appropriate to the nature of the activity or operation and include:

- reducing the number of employees exposed to the risk;
- providing plant that is explosion resistant;
- providing explosion suppression or explosion relief equipment;
- taking measures to control or minimise the spread of fires or explosions;
- providing suitable personal protective equipment.

Preparing emergency plans and procedures

Arrangements must be made to deal with emergencies. These plans and procedures should cover safety drills and suitable communication and warning systems and should be in proportion to the risks. If an emergency occurs, workers tasked with carrying out repairs or other necessary work must be provided with the appropriate equipment to allow them to carry out this work safely.

Preparing emergency plans and procedures

The information in the emergency plans and procedures must be made available to the emergency services to allow them to develop their own plans if necessary. Providing information, instruction and training for employees. Employees must be provided with relevant information, instructions and training.

This Includes:

- the dangerous substances present in the workplace and the risks they present including access to any relevant safety data sheets and information on any other legislation that applies to the dangerous substance;
- the findings of the risk assessment and the control measures put in place as a result (including their purpose and how to follow and use them);
- emergency procedures.

Information, instruction and training need only be provided to other people (non-employees) where it is required to ensure their safety. It should be in proportion to the level and type of risk. The contents of pipes, containers, etc must be identifiable to alert employees and others to the presence of dangerous substances. If the contents have already been identified in order to meet the requirements of other law, this does not need to be done again under DSEAR.
Places where explosive atmospheres may occur ('ATEX' requirements) DSEAR places additional duties on employers where potentially explosive atmospheres may occur in the workplace. These duties include:

- identifying and classifying (zoning) areas where potentially explosive atmospheres may occur;
- avoiding ignition sources in zoned areas, in particular those from electrical and mechanical equipment;
- where necessary, identifying the entrances to zoned areas;
- providing appropriate anti-static clothing for employees;
- before they come into operation, verifying the overall explosion protection safety of areas where explosive atmospheres may occur.
- Further information and guidance on the DSEAR requirements relating to explosive atmosphere

This part of DSEAR compliments the requirements of **the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 1996**