**DSEAR**

The Dangerous Substances and Explosive Atmospheres Regulations.

Fuel Storage Solutions has great deal of experience in regard to DSEAR risk assessing, predominantly to the British Military on various installations in the UK with great success.

To ensure that we meet the regulatory requirements of DSEAR we utilise various documents, this includes the methodology from the Management of health and safety in defence, JSP 375, Vol 1 Chapter 9 which we base our DSEAR reporting practices on. In addition to this the other regulations that we utilise to ensure the correct guidance if followed can be found at the legislation and guidance section within this document.

**Prior to attending site.**

Prior to the site visit the client is requested to ensure that the following is completed:

* Site is informed of the pending visit.
* Security passes and access to all areas required applicable to the DSEAR assessment.
* Site representatives are available.
* Any additional requirements for site access.

In addition, the client is also requested to send electronically/make available any supporting records/documents.

Sources of existing information that may be required to assist/support a DSEAR risk assessment are listed below (list not exhaustive):

|  |  |
| --- | --- |
| **Issue** | **Existing Records/Documentation** |
| Materials Used | COSHH Forms |
| PPE / RPE | Health Surveillance Reports  Health & Safety Risk Assessments |
| Operating Procedures  or the process / activity in  normal, start-up, shutdown or  abnormal operations | SOPs  Operator before use / after use  inspections / maintenance |
| Details of operator training | Personnel Training Records |
| Details of fire plans including escape routes | Fire Safety Management Plan |
| Environment and spillage plan as applicable |  |
| Details of Hazardous Area  Classification Drawings and  marking of hazardous area  zones | If available |
| Existing Controls | Hazardous area register/  Site Safety procedures |
| Signage |  |
| Periodic Equipment Inspection |  |
| Preventative Maintenance Programme | Maintenance records  Equipment/Platform maintenance regimes. |
| Regular audits and reviews | Audit regime as required |

**Risk assessment stage 1**

A Stage 1 DSEAR risk assessment must be undertaken (to ascertain if a full DSEAR assessment is required) for any process or activity that is suspected to have the potential to create an explosive atmosphere in normal operation, handling, storage or maintenance; and recorded on the FSS Stage 1 Form.

**Risk Assessment stage 2**

If the Stage 1 DSEAR risk assessment identifies a possibility of dangerous substances or processes that may result in an explosive atmosphere, then a Stage 2 DSEAR risk assessment must be carried out. The Stage 2 DSEAR risk assessment assesses the fire and explosion risks that may result from the ignition of the dangerous substances. A summary of the residual hazards and risks should be recorded on the FSS Stage 2 report and reference the relevant supporting evidence / documents.

**Drawings**

An essential component of the Stage 2 DSEAR risk assessment is the production of hazardous area classification (HAC) drawings.

A hazardous area is defined as a three-dimensional space in which a flammable atmosphere may be expected to be present at such frequencies as to require special precautions for the design and construction of equipment and the control of other potential ignition sources.

The aim of area classification is to avoid ignition of those releases that may occur from time to time in the normal operation of facilities. The approach should always be to reduce the probability of coincidence of a flammable atmosphere and an electrical or other source of ignition and to minimise the extent of the hazard radii.

**The client is responsible to ensure that adequate drawings of the site are produced electronically meeting the requirements below and forwarded to FSS prior to the site visit.**

Drawings shall be compatible with and transferable onto existing site drawings, are to be legible, they must be capable of interpretation when printed at A3 size and when printed in black / grey only.

* Relevant adjacent site features.
* Manhole covers.
* Topography relevant to the hazardous area and where there is a variance in levels of more than 1 metre up to 2 metres beyond the perimeter of the hazardous zone.
* Pipework and pipelines.
* Staircases and stairwells.
* Above or below ground ducting.
* Relevant electrical equipment.
* Relevant instrumentation.
* Tanker delivery points.

**DSEAR Risk Assessment Report Format**

DSEAR risk assessments will be carried out for hazardous processes on the installation/site and shall follow the requirements and report format as shown below.

* Front Page
* Introduction and background
* Report Contents
* Hazard identification
* DSEAR Risk Assessments
* Distribution List

Quote

**Background**

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). The text of the Regulations can be found at the HMSO website as follows:

[Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR)](http://www.legislation.gov.uk/uksi/2002/2776/contents/made)

DSEAR requires employers to assess the risks of fires and explosions that may be caused by dangerous substances in the workplace. From June 2015 DSEAR also covers the risk caused by gases under pressure and substances that are corrosive to metals.  This is to allow for changes in the EU Chemical Agents Directive the physical hazards aspects of which are enacted in Great Britain through DSEAR.  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](http://www.legislation.gov.uk/uksi/1999/3242/contents/made)

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](http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexplus!prod!DocNumber&lg=en&type_doc=Directive&an_doc=1998&nu_doc=24)
* [Explosive Atmospheres Directive](http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31999L0092:en:NOT)

**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 or through corrosion to metal

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.  Gases under pressure can also cause explosions creating harmful effects. Substances that are corrosive to metal may cause damage to metal/metal containing structures which could result in reduced structural integrity.

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
* Handling, storage and use of gases under pressure
* Handling, storage and use of substances corrosive to metal.

**Where does DSEAR apply?**

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 offshore oil and gas production. See the 'Explosive atmospheres and ATEX' section for more information.

[**Explosive atmospheres and ATEX**](https://www.hse.gov.uk/fireandexplosion/atex.htm)

**What are dangerous substances?**

**Dangerous substances are substances or mixtures of subst**ances (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 or are corrosive to metal. Liquids, gases, vapours and dusts that may be found in a workplace can all be dangerous substances.

Dangerous substances include:

* A substance or mixture which meets the criteria for classification as hazardous within any physical hazard class laid down in the CLP Regulation whether or not the substance is classified under that regulation. Many dangerous substances have classifications which are agreed at EU level. These are given in Table 3.2 in part 3 of Annex VI to the [EU Regulation on classification, labelling and packaging of substances and mixtures, or 'CLP' Regulation](https://www.hse.gov.uk/chemical-classification/legal/legislation.htm).
* 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 CLPR. For example, high flashpoint liquids present in the workplace at elevated temperatures.

Under the EU CLP Regulation there are a number of substances that now meet the criteria for classification as flammable which did not do so in the past. This is partly because the upper flashpoint for classification as a flammable liquid has been increased from 55 °C to 60 °C. The changes mean that for example, diesel, gas oil and light heating oils are now classified as flammable liquids. However, many substances so classified may in fact not normally present a significant risk of fire as stored. Employers should adopt a proportionate approach in considering whether there are any justifiable further measures needed in addition to those widely used before this change, given that the risk itself has not changed.

**Legislation and Guidance:**

The information listed below is not exhaustive, where required additional industry standard documents will be used.

* Health and Safety at Work etc. Act 1974
* Dangerous Substances and Explosive Atmospheres Regulations
* Control of Substances Hazardous to Health Regulation
* Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation);
* Management of Health and Safety at Work Regulations
* The Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations
* The Regulatory Reform (Fire Safety) Order
* HSE - L133 – Unloading petrol from road tankers
* HSE - L138 - Dangerous substances and explosive atmospheres
* International Electrotechnical Commission - IECEx 05 – Certificate of Personal Competence
* Energy Institute – Model Code of Safe Practice Part 15: Area Classification Code for Installations Handling Flammable Fluids.

British Standards

* BS EN 60079 series - Electrical apparatus for explosive atmospheres
* BS EN 61241/3 - Electrical apparatus for use in the presence of combustible dust
* BS EN 1127 series - Explosive Atmospheres – explosion prevention and protection.