



ABB's Fast Track Guide to

- Field*
- Control*
- Inform*
- Analyze*
- Engineer*
- Power*

ATEX Compliance

The ATEX Directives and DSEAR (Dangerous Substances and Explosive Atmospheres Regulations)

An ABB Guide with a

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ATEX 95¹ / ATEX 137

The Explosive Atmospheres Directives (ATEX 95¹ & 137) are new legislation covering the requirements of employers to protect both staff and local communities from the risk of an explosive atmosphere. These are implemented throughout the European Union after 30 June 2003 following 6 and a half years of transition. An explosive atmosphere is one in the form of gases, vapours, mists or dusts, which can be ignited under certain operating conditions by a source of ignition being, electrical, mechanical, static, hot surfaces etc.

ATEX 95¹ (Directive 94/9/EC) allows the free movement of goods throughout the EU by harmonising the technical and legal requirements for products that will be used in potentially explosive atmospheres. In the UK, its requirements are implemented by 'The Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 1996' (EPS). (See guidelines published by the European Commission in 2001 to help with the interpretation and DTI guidelines on the implementation of the UK Regulations.)

ATEX 95¹ applies to both electrical and mechanical equipment and protective systems for use in potentially explosive atmospheres. Also covered are components and devices for use outside potentially explosive atmospheres but which are necessary for, or contribute to, the safe functioning of equipment and protective systems in such atmospheres. Equipment already in use at 30 June 2003 may continue to be used providing the risk assessment required by the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) indicates that it is safe to do so. However a piece of equipment certified before 30 June 2003 under superseded provisions, can be repaired using an identical part or with a new ATEX compliant component, which may not be identical, but still be used without the need to bring the equipment into conformity again after this date, provided that the equipment is not changed substantially, effectively making it into 'new' equipment.

For products in the higher risk categories, for example where an explosive atmosphere is likely to be present for considerable periods of time, or where the consequence of an explosion would be particularly severe, the manufacturer will ask a Notified Body to conduct the EC type examination procedure to ensure that the design of the product conforms to essential health and safety requirements.

From 30 June 2003, products can be certified by any of the Notified Bodies appointed by the EU member states (including the three UK appointed Notified bodies). Any certificates and any associated documents must be available in the language of the country in which it is to be used. This will be especially relevant for products designed for lower risk situations, principally Category 3*, where manufacturers are entitled to self declare conformity to the Regulations.

***EN 13463-1** Non – electrical equipment for potentially explosive atmospheres, Part 1: Basic method and requirements (January 2002).

ATEX 137 (Directive 99/92/EC) ensures that workers enjoy a minimum level of health and safety protection from potentially explosive atmospheres in the workplace. The employer has the duty to assess explosion risks and classify

¹ (N.B. ATEX 95 is also commonly known as ATEX 100. Both ATEX 95 and ATEX 100 refer to Directive 94/9/EC).

the workplace into zones, with appropriate management systems including training of workers and control of work. The workplace and work equipment, including warning devices, should be designed, operated and maintained with due regard for safety. In the UK the requirements under this directive are implemented in the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) December 2002, supported by an Approved Code of Practice. Workplaces used for the first time after 30 June 2003 and also all modifications to existing plant after this date should comply. Existing workplaces already in use at this date will also need to comply - no later than 30 June 2006.

Essentially the Directive calls for the following activities to be undertaken and documented accordingly:

- Risk assessments for operating plant are to be updated covering hazard identification and risk potential
- Zoning of plant to the new categories must have been undertaken
- Identification of zoned areas and adequate labelling of pipes and containers contents
- Emergency and incident handling mechanisms are in place and understood
- ATEX 'CE' marked equipment following the end of June 2003 must be installed, maintained and repaired in accordance with the Product Directive 94/9/EC requirements
- Operations staff are fully informed and trained in all of the above!

DSEAR

Dangerous Substances and Explosive Atmospheres Regulations (DSEAR)

UK regulations implementing both the flammable/explosive elements of both the Chemical Agents and ATEX 137 Directive came into force during 2002 and underpin the June 2003 ATEX Directive.

DSEAR aims to protect the safety of employees and others from those dangerous substances that can cause explosions or fires during the working day.

The new Regulations augment the existing Health And Safety at Work Act requirements for employers to provide competent management and personnel as well as policies and procedures for correct maintenance activities.

A major consequence is the requirement for all existing hazardous areas to be re-assessed for safety risk and for mechanical sources of ignition and heat energy to be identified and added to the existing instrument / electrical sources.

DSEAR covers the following main topic areas:

- The identification of dangerous substances used within the operation and the inherent safety risks associated with the operation of the plant processes
- The requirement for a formal risk assessment to be carried out prior to the introduction of any equipment, protective systems or components into potentially flammable atmospheres
- Safety measures are taken to eliminate, control and mitigate the identified risks
- Area classification and zoning of the operating plant
- New requirements for the design and project process of hazardous area installations
- Marking and signage appropriate to the zoning category
- Considerations for issuing non-static clothing to operations staff working within zoned areas
- Verification of new installations before use by a person competent in explosion protection
- Steps for making information available for dealing with incidents, accidents and emergencies
- Full instructions and training for staff including actions to be taken in the event of an emergency

Key Points on the Route to Compliance

- The majority of the existing guidance to hazardous area management is still valid from the safety viewpoint and hence there should be no need to start from scratch with regard to DSEAR compliance
- Complying with and implementing ATEX in a logical structured way are not huge burdens in terms of cost but an amount of new labelling will be required on piping and vessels
- Current zoning calculations may need to be reviewed because of the statutory link to EPS 1996 and the selection of equipment
- Mechanical risk assessments are now required, also including zoning. Zone 1 or 0 mounting may have cost implications
- The current documentation under the Management of Health and Safety at Work Regulations 1999 (MHSW) may need revising in line with DSEAR wording. This should be seen as not too much of a change to the existing documents, however the requirement for formal area classification (risk assessments) and zoning diagrams will now need to be a formal part of the existing safety management procedures
- It is expected that the required Risk Assessment document will not require a re-write of the existing safety documents at plants. It should mostly contain the references to the whereabouts and mapping interpretation of the DSEAR requirements to the existing safety management system documentation
- Control of flammable atmospheres will need to be very evident within the supporting safety management and risk assessment documentation

The ABB 3 Step Approach to Compliance with ATEX / DSEAR

DSEAR will apply to a wide range of businesses. Business premises will normally include all industrial and commercial premises where a dangerous substance is present or is liable to be present during the working day (N.B. offshore facilities and domestic dwellings are excluded in the Regulations).

Please see the chart on the reverse to view the overall Route Map to Compliance

- Step 1** - Identification of hazards requiring compliance and relevant safety measures
- Step 2** - Classification of risks, and implementation of safety procedures
- Step 3** - Follow through, operation and ongoing safety

| Step 1 Existing Hazards and Safety Measures | |
|---|--|
| A/ Identification and assessment of hazards | Identify and assess the fire and explosion risks of dangerous substances used within the operating plant. |
| B/ Safety measures and minimising risk | Apply safety measures to eliminate or reduce the risks from the use of these substances to be as low as reasonably practicable. Dusts will need to be part of this process as they have previously not been considered in as much detail as gases and liquids. Reduce risks further by control and mitigation measures (often involving the substitution of substances with, say, a higher flashpoint where possible). |
| C/ Evaluate any modifications | Ensure that any modifications do not themselves increase risk potential or introduce other, unassessed risk. |
| D/ Remember the objectives throughout | Ensure that employees and public are protected from fires and explosion. |

| Step 2 Classifying and Implementing | |
|---|---|
| Once the safety measures are understood and no further improvements can be made to the operation the plant can be put forward for an area classification risk assessment meeting. | |
| A/ Area Classification | The area classification risk assessment meeting of the plant operation must prevent and provide protection against explosions covering control / electrical and mechanical potential sources – including friction or heating, presence of foreign bodies and static discharge. |
| B/ Prevention, avoidance, mitigation | Prevent formation of explosive atmospheres, avoid ignition of explosive atmospheres, and mitigate effects of explosion so as to ensure health and safety of staff and others. Take certain steps in addition to the above requirements so that overall precautions for an explosion in one factory cannot be seen to affect another business nearby. Classify the operating plant into zones with corresponding equipment categories. |
| C/ New and existing equipment | Generate design change or improvement programmes for the plant to decrease the zoning category so as to make installation, inspection and repair costs as effective as possible. Select equipment to EPS 1996 Regulation requirements under ATEX 95. |
| D/ Implement safety procedures | Before first use of workplace, verify the installation safety situation and design process with competent persons. Co-ordinate safety controls and measures in shared workplaces. Provide operating and safety information, instructions and training to employees including information to ensure safe working in operations and maintenance. |

| Step 3 Follow through, Operation and the Future | |
|--|---|
| Once agreed, with the risk assessment and design package phase completed, and the plant put into service, the ongoing maintenance, inspection and repair attributes of the regulations are required. | |
| A/ Operation and ongoing policies | Provide policies, procedures and guidance information to ensure safe working in operations and maintenance |
| B/ Training | Ensure adequate training is given to all relevant staff including a programme of future refresher training. Consideration should be given to recognised competency schemes such as COMPEX training for installation and inspection technicians. |
| C/ Zoning and marking | Mark zoned areas with Ex signs wherever necessary. Provide suitable signage on the main access thoroughfares to a zoned area; identify and label piping and containers that contain recognised dangerous substances. Update the general zoning site map from the specific project documentation map – reclassify the area for specific zones. Particularly review the permit-to-work details to ensure hot work such as welding is reviewed in light of any new changes. |
| D/ Inspection, maintenance, repair and change | Implement a programme of equipment inspection and repair. This should be documented to provide reporting analysis on equipment performance. The management of change procedures will need to be reviewed to augment the need for compliance with DSEAR. Ensure there is a clear policy communicated to staff for the reporting and remediation of accidents, incidents and emergencies including a programme of regular practice. |

Some further References

- The Dangerous Substances and Explosive Atmospheres Regulations 2002
- The Chemicals (Hazard Information and Packaging for Supply) Regulations 2002
- The Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 1996
- The Management of Health and Safety at Work Regulations 1999
- Hazardous Area Inspection and Repair Software (HAZAIR)

A FREE copy of ABB's ATEX Jargon Buster can be obtained by e-mailing enquiries@abbiap.com. For further information on ATEX, visit www.abb.co.uk/bigissues. For more information on ABB's ATEX consultative services, call 0870 600 6122.



ABB's Fast Track Guide to ATEX Compliance

| PROMPT | STEP | ABB Service/Product | DSEAR Regulation Conformance |
|---|---|---|---|
| <p>ARE YOUR ANSWERS TO THESE QUESTIONS YES?</p> <ul style="list-style-type: none"> Is the DSEAR regulation applicable to your operation or process? Is there a possibility that combustible/inflammable atmospheres could occur? Do you have these substances identified – is it written down as part of your operational risk assessment e.g. COMAH requirement? | <p>THEN YOU NEED TO TAKE THESE STEPS</p> <p>START ATEX COMPLIANCE</p> <p>↓</p> <p>INHERENT SAFETY AUDIT</p> | <p>THIS IS HOW WE COULD HELP YOU</p> <ul style="list-style-type: none"> Training & awareness High level operational risk assessment Process safety review Eliminate, reduce & control | <p>THESE ARE THE RELEVANT PARTS OF DSEAR</p> <p>REGULATION 4</p> <p>REGULATION 6</p> |
| <ul style="list-style-type: none"> Do you know where, how and what consequence the residual risks may be on the plant? Have you identified the potential and likelihood of a flammable or combustible atmosphere occurring? Have you fully documented the assessment justification and assigned the correct zoning conditions for the plant? Are your existing protective systems adequate? Have you confirmed the Electrical / Instrumentation / Mechanical (E/I/M) equipment is fit for purpose? Can you resolve classification issues in the most cost efficient manner? | <p>THE BASIS FOR SAFETY/RISK ASSESSMENT</p> <p>↓</p> <p>ZONING</p> <p>↓</p> <p>EQUIPMENT INVENTORY CHECKS</p> <p>↓</p> <p>IMPROVEMENT PROGRAMME</p> <p><small>After the inventory, unassessed equipment might need Safety/Risk assessment (especially mechanical)</small></p> | <ul style="list-style-type: none"> Area classification risk assessment including consequences to Electrical / Instrumentation / Mechanical (E/I/M) equipment Explosion relief Static protection Suppression protection ABB ATEX equipment Additional risk assessment for mechanical equipment Project design package & consultancy services | <p>REGULATION 5</p> <p>REGULATION 7</p> <p>REGULATION 17</p> |
| <ul style="list-style-type: none"> Have you checked existing or fitted new labelling to equipment including vessels piping and containers? Can you demonstrate you are inspecting, maintaining and repairing equipment – do you analyse document records for compliance? Do you operate an effective permit to work system? Do you assess the real impact of a proposed modification and the consequences of the change? Does your existing safety management system cover all the steps above? | <p>LABELLING OF EQUIPMENT</p> <p>↓</p> <p>MAINTENANCE & INSPECTION</p> <p>↓</p> <p>WORK CONTROL PROCEDURES</p> <p>↓</p> <p>MODIFICATIONS</p> <p>↑ ↑ ↑</p> <p>SAFETY MANAGEMENT SYSTEM</p> <p><small>Work control should feed back constantly into Maintenance and Inspection to ensure M&I procedures are kept updated, particularly with mechanical equipment</small></p> <p><small>Modifications to equipment may mean that Safety and Risk need reassessment</small></p> | <ul style="list-style-type: none"> Agree and implement boundary signs, piping, and containers HAZAIR software tool Inspection services Develop and issue procedures & guidance Project & consultancy services Risk assessments Competency & assessment Incident handling Auditing Management & design procedures | <p>REGULATION 10</p> <p>REGULATION 7</p> <p>REGULATION 6</p> <p>REGULATION 5</p> <p>REGULATION 6</p> <p>REGULATION 8</p> <p>REGULATION 9</p> <p>REGULATION 11</p> |

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