

## **THE ATEX DIRECTIVES – A ROUTE MAP FOR COMPLIANCE WITH THE UK REGULATIONS**

John Walkington – Senior Lead Consultant ABB Process Industries

Eric Gilchrist – Principal Consultant ABB Process Industries

### **WHO & WHAT IS ‘ATEX’?**

There are two ATEX (‘Atmospheriques Explosives’) Directives that are applicable to equipment in potentially explosive atmospheres and these will be implemented throughout the European Union after 30 June 2003.

The Explosive Atmospheres Directives (ATEX 95 & 137) are new legislation covering the requirements of employers to protect both staff and local communities from the risk of an explosive atmosphere. An explosive atmosphere can be one in the form of gases, vapours, mists or dusts, which can ignited under certain operating conditions by a source of ignition being, electrical, mechanical, static, hot surfaces, etc.

Directive 94/9/EC, known as ATEX 95, 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). The Directive is supported by a set of guidelines published by the European Commission in 2001 to help with the interpretation of the Directive and there is a set of DTI guidelines on the implementation of the UK Regulations.

After 30 June 2003, which follows a six and a half year transition period, manufacturers and users of equipment, protective systems and safety devices will have to comply with this Directive. The directive 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 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 However a piece of equipment certified before 30 June 2003 under superseded provisions, can be repaired using an identical part or with a new ATEX compliant component, which may not be identical, be still used without the need to bring the equipment into conformity again after this date, provided that the equipment is not changed substantially. What this means is that equipment placed on the market before the Directive came fully into force is not caught by the Directive unless it is changed into a “new” product by substantial modification.

This Directive means that manufactures in the European Union (EU) member states are, for the first time, set to work to common agreed standards. For products, which are in the higher risk categories, for example where an explosive atmosphere is likely to be present for a considerable periods of time, or where the consequence of an explosion would be particularly severe, the manufacture 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. These Notified Bodies (NB) are not peculiar to ATEX. EU

Member States are responsible for notification of bodies to carry out tasks relating to the conformity assessment procedures for all “new approach” Directives, which includes ATEX. Therefore from 30 June 2003 products could have been certified by any of the Notified Bodies appointed by the EU Member States and therefore not only the three UK appointed Notified bodies we have been used to. So it will be important that any certificates and any associated documents are 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 manufactures 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” was published in January 2002. The standard requires the manufacture to carry out a formal documented hazard analysis that identifies and lists all of the potential sources of ignition by the equipment and the measures to be applied to prevent them becoming effective. If equipment is designed and constructed according to good engineering practice and the ignition hazard assessment ensures that the equipment does not contain any effective ignition sources in normal operation, the equipment can be classified as Category 3 equipment solely on the basis of this standard. Therefore as this standard requires the manufacture to provide a copy of this ignition hazard assessment they have carried out on their equipment to the user this will help the user in the preparation of their ‘risk assessment document’ called for by DSEAR. For older equipment or equipment imported directly by the end user from outside the EU member states this ignition hazard assessment may need to be carried out by the end user.

Directive 99/92/EC, known as ATEX 137, ensures that workers enjoy a minimum level of protection from potentially explosive atmospheres. In covering safety and health protection of employees, it places duties on the employer. The employer should demonstrate that explosion risks have been determined and assessed with places classified into zones. Appropriate management systems should be in place 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). These Regulations came into force on the 9 December 2002 with the ATEX part coming into force on the 1 July 2003. An Approved Code of Practice will support these Regulations, which is due to be published early in 2003.

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 made up to date covering hazard identification and likelihood of risk potential.
- ◆ Zoning of plant to the new categories has been duly undertaken.
- ◆ Identification of zoned areas and contents of pipes and containers are adequately labeled.

- ◆ Emergency and incident handling mechanisms are in place and understood.
- ◆ Use of appropriately ATEX 'CE' marked equipment following the end of June 2003 is 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!

### **DANGEROUS SUBSTANCES AND EXPLOSIVE ATMOSPHERES REGULATIONS (DSEAR)**

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

The essence of DSEAR is to protect the safety of employees and others from those dangerous substances that can cause explosions or fires during the working day. The new DSEAR regulations will deal with explosions and fires that are caused by dangerous substances that generate explosive atmospheres whether they are gases, vapours or dusts. The new 17 part regulations will replace certain older UK safety legislation in the process e.g. The Highly Flammable Liquids & Liquefied Petroleum Gases Regulations 1972.

The new Regulations will 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.

With the advent of DSEAR there are new additional constraints for the User on how he identifies process hazards and operational risks, designs (with particular inclusion of formal risk assessments), maintains and repairs the hazardous area equipment in service. Many operators will have already covered hazardous areas for instrument / electrical equipment, but there is now a need to risk assess the mechanical equipment as well.

Similar in nature to the key attributes of ATEX, 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 of 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 is undertaken.
- ◆ New requirements for the design and project process of hazardous area installations.
- ◆ Marking and Signage appropriate to the zoning category is put in place.
- ◆ Consideration to the issue of non-static clothing to operations staff working within these zoned areas.

- ◆ A person competent in explosion protection undertakes verification of new installations before use.
- ◆ Information is to be generated and made available to deal with incidents, accidents and emergencies.
- ◆ Full instructions and training is given to staff including actions to be taken in the event of an emergency.

### **SO HOW DO I COMPLY?**

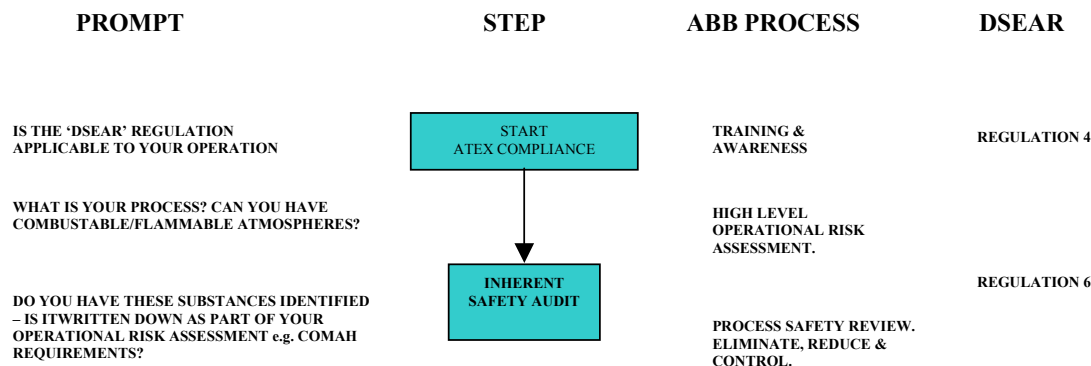
ABB address this question by offering to outline one approach to compliance covering the requirements of the DSEAR regulations. In most cases the implications for industry are not too onerous. Responsible operators with mature safety management policies and systems in place to comply with current legislation will be well placed to offer evidence and justification in support of DSEAR requirements.

### **KEY AREAS OF CONSIDERATION WILL BE:**

- ◆ The majority of the existing guidance to hazardous area management will still be valid from the safety viewpoint and hence there should be no need to start from scratch with regard to DSEAR compliance.
- ◆ The view from industry that complying with ATEX in a logical structured way is not a huge burden in terms of cost.
- ◆ Current zoning calculations may need to be reviewed because of the statutory link to EPS 1996 and the selection of equipment (Particularly Mechanical items).
- ◆ The current documentation under the Management of Health and Safety at Works 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 procedure set.
- ◆ It is expected that the required 'Risk Assessment document' will not require a re-write of the safety documents, which already exist for the plants. It should mostly contain the references to the whereabouts and mapping interpretation of the DSEAR requirements to the existing current 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 STEP APPROACH**

DSEAR will apply to a wide range of businesses. Business premises will normally include all industrial and commercial premises, (Note - offshore facilities and domestic dwellings are excluded in the Regulations) where a dangerous substance is present or is liable to be present during the working day. Here ABB offer as part of their project management, consultancy and equipment methodologies a step approach for compliance.



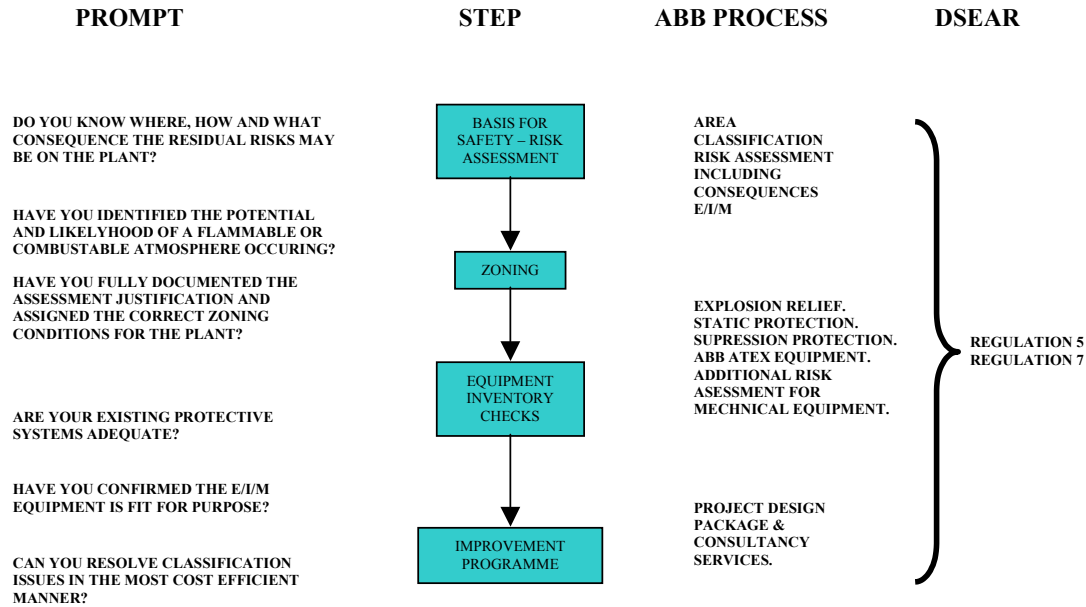
### STEP 1

- ◆ Identify and assess the fire and explosion risks of dangerous substances used within the operating plant. Note the Chemicals Hazard Information and Packaging for Supply Regulations 2002 (CHIPS) will help in this process as this will automatically indicate the substance as assessed is a dangerous substance under DSEAR. Properties of materials are to be agreed and documented.
- ◆ 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 until now. Note that the elimination process has not been as emphasised in existing legislation and forms a crucial part of this risk assessment process. Reduce risks further by control and mitigation measures (Often involving substitute substances, with say a higher flashpoint, where possible).
- ◆ (Overall aim) To ensure that employees and public are protected from fires and explosion. Remember this is the real detail for the high level steps.

Once the safety measures are understood and no further improvements can be made to the operation the plant can be put forward on this basis of safety for an area classification risk assessment meeting. However bearing in mind that any changes made to the operation as part of the inherent safety review in themselves do not introduce other or increase the potential safety risks to the plant.

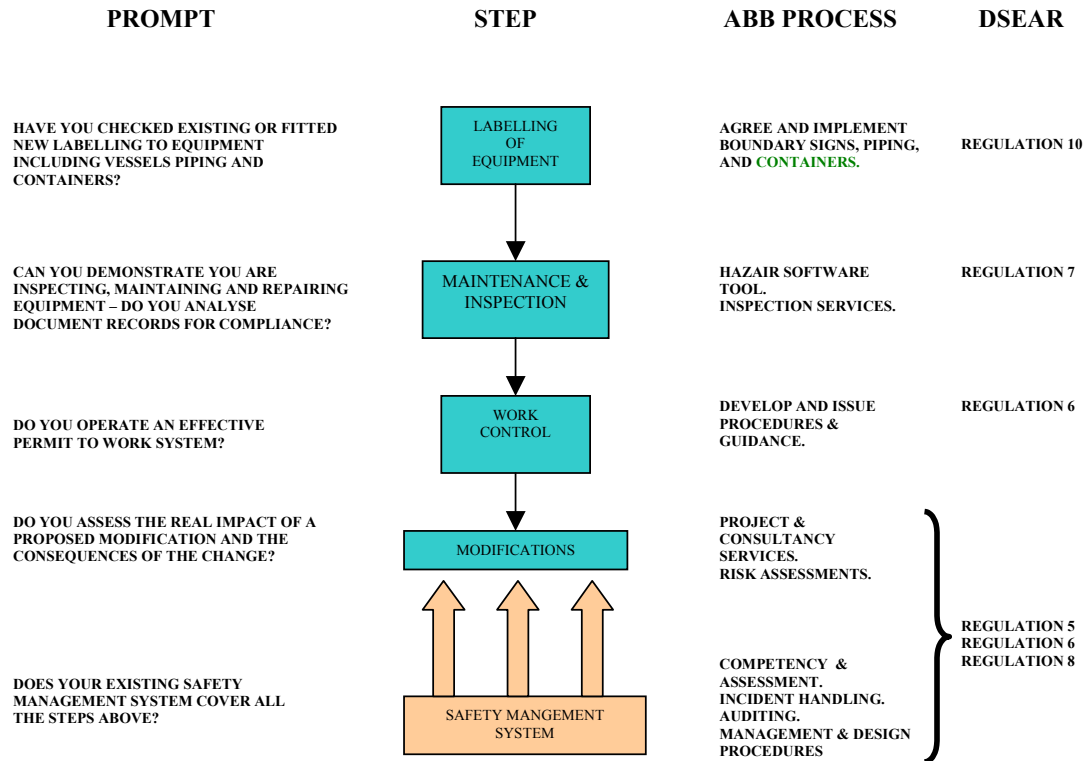
### STEP 2

- ◆ Undertake an area classification risk assessment meeting of the plant operation to prevent and provide protection against explosions covering control / electrical and mechanical potential sources – including friction or heating, presence of foreign bodies and static discharge.



- ◆ Prevent formation of explosive atmospheres, avoid ignition of explosive atmospheres, and mitigate effects of explosion so as to ensure health & safety of staff and others.
- ◆ Take certain steps in addition to the above requirements so that overall precautions for one explosion in one factory cannot be seen to affect another business nearby.
- ◆ Classify the operating plant into zones with corresponding equipment categories.
- ◆ 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.
- ◆ Before first use of workplace – verify the installation safety case and design process with a competent person – normally as part of the commissioning checklists and seen as a trade-off from excessive detail and what is required for safety.
- ◆ 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.
- ◆ Provide systems and procedures for emergencies - Explosion relief, static controls, fire detection, procedures, for emergency services and response processes in place). Note this should be in conjunction with the relevant fire authorities that should contribute and have ownership of the requirements.

Once agreed and the risk assessment and design package phase is completed with the plant put into service, the ongoing maintenance, inspection and repair attributes of the regulations are required.



STEP 3

- ◆ Provide policies procedures and guidance information to ensure safe working in operations and maintenance.
- ◆ 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 tradesmen.
- ◆ Mark zoned areas with Ex sign where possible – Only where necessary – Provide suitable signage on the main access thoroughfares to a zoned area and identify and label piping and containers that contain recognised dangerous substances. Particularly review the permit to work details to ensure hot work such as welding is reviewed in light of any new changes.
- ◆ Update the general zoning site map from the specific project documentation map – reclassify the area for specific zones.
- ◆ 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 changed 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.

## CONCLUSION

### THE PRACTICAL REALITY:-

- ◆ It's going to be Law.
- ◆ For organisations who already have mature systems conforming to the requirements of MHSW, two thirds of the existing plant operational documentation should be available to demonstrate compliance to DSEAR.
- ◆ It could cost end users a lot of money if not properly implemented. Especially on the amount of new labelling required when considering piping and vessels.
- ◆ Mechanical risk assessments are now required – Implementation of forthcoming standards and learning will take a little time to bed in.
- ◆ Equipment for mounting in Zone 1 or 0 could become a lot more expensive – (Particularly for Mechanical Items!).
- ◆ An explanatory mapping document (Risk Assessment Document) describing how the ATEX Directive has been complied with is required.

## 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 Works Regulations 1999.  
Hazardous Area Inspection and Repair Software (HAZAIR).