

ATEX - a review

European Legislation for potentially explosive atmospheres

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MTL Instruments

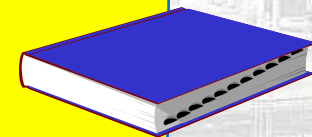
- New Approach to technical harmonisation 1987
- Global approach to conformity assessment 1993
- Directives adopting this dual purpose approach prevent restrictions to trade and assure high levels of protection through technical harmonisation
 - Products need to meet mandatory essential requirements, follow appropriate conformity assessment procedures and follow CE marking schemes



The Single Market



- Businesses have a choice of how they comply with the essential requirements
- European Standards bodies draw up technical specifications that offer one possible route to comply, alternatively the manufacturer can demonstrate compliance with essential health and safety requirements (EHSR's)
- Guidance on the implementation of these directives can be found in the 'Blue Book' available free from the European Commission



The Single Market

ATEX Directives

- Two specific Directives which concern potentially explosive atmospheres are; -
 - **Directive 94/9/EC (100a)**, aimed at manufacturers of equipment intended for use in potentially explosive atmospheres (p.e.a.)
 - **Directive 1999/92/EC (137)** sets out the minimum requirements for the protection of workers potentially at risk from explosive atmospheres

These Directives are commonly called the
'ATEX' Directives

ATmosphères **EX**plosibles

Also adopting ATEX

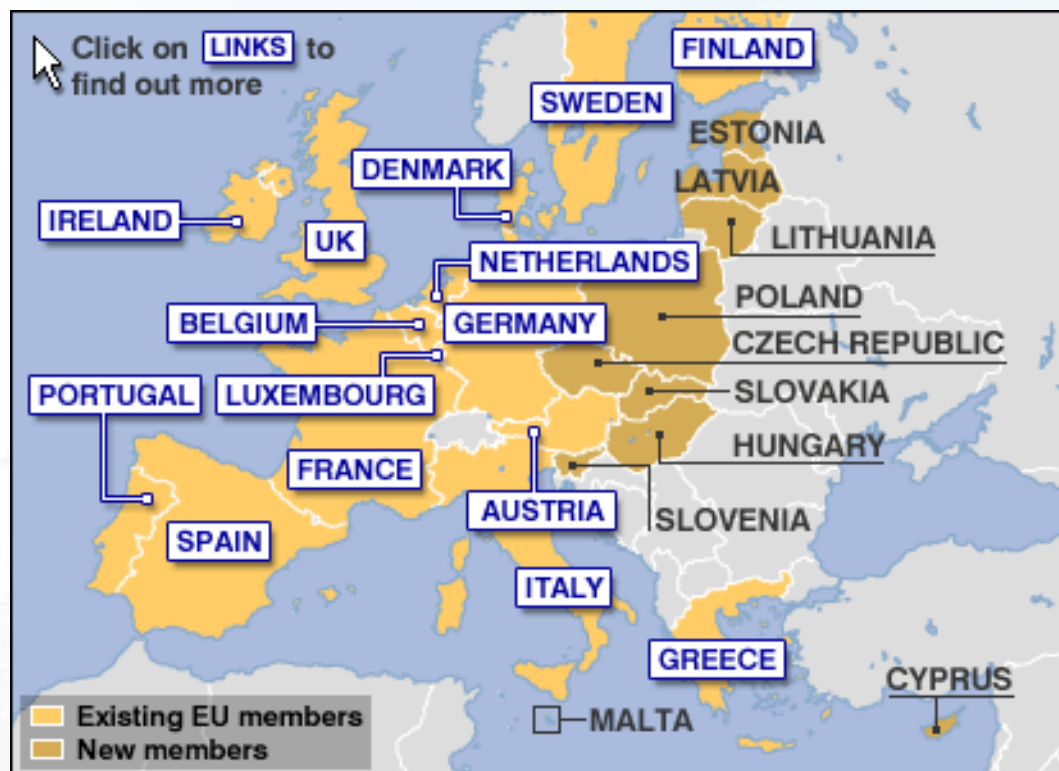
Switzerland (2000)

European Economic Area

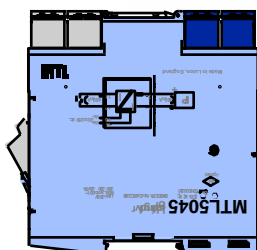
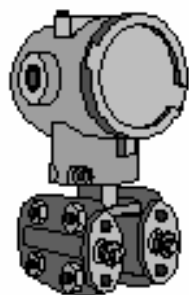
Norway

Iceland

Liechtenstein



European Community Members 25+



- Equipment and protective systems
- Equipment Category
- Essential Health and Safety requirements
- Marking
- Design
- Conformity assessment
- Comply by 1 July 2003



Directive 94/9/EC

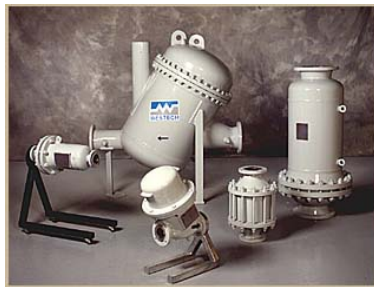
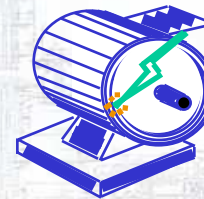
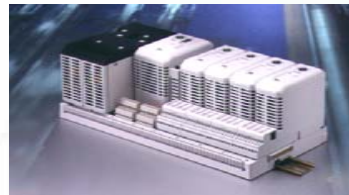
Safety of equipment
 100a(95)

Which products fall within the scope of this Directive?

- those that are used in potentially explosive atmospheres

Chapter 1, **Article 1.3(a) Equipment**

Examples - instrumentation, motors, fork lift trucks



Article 1.3(b) 'Protective systems' - units which are intended to halt incipient explosions immediately and/or to limit effective range of explosion flames and pressures

NOT systems required to ensure that an explosion protection technique is effective

Examples - pressure relief panels, water curtains, flame arrestors

Article 1.3(c) Components EEx d enclosures





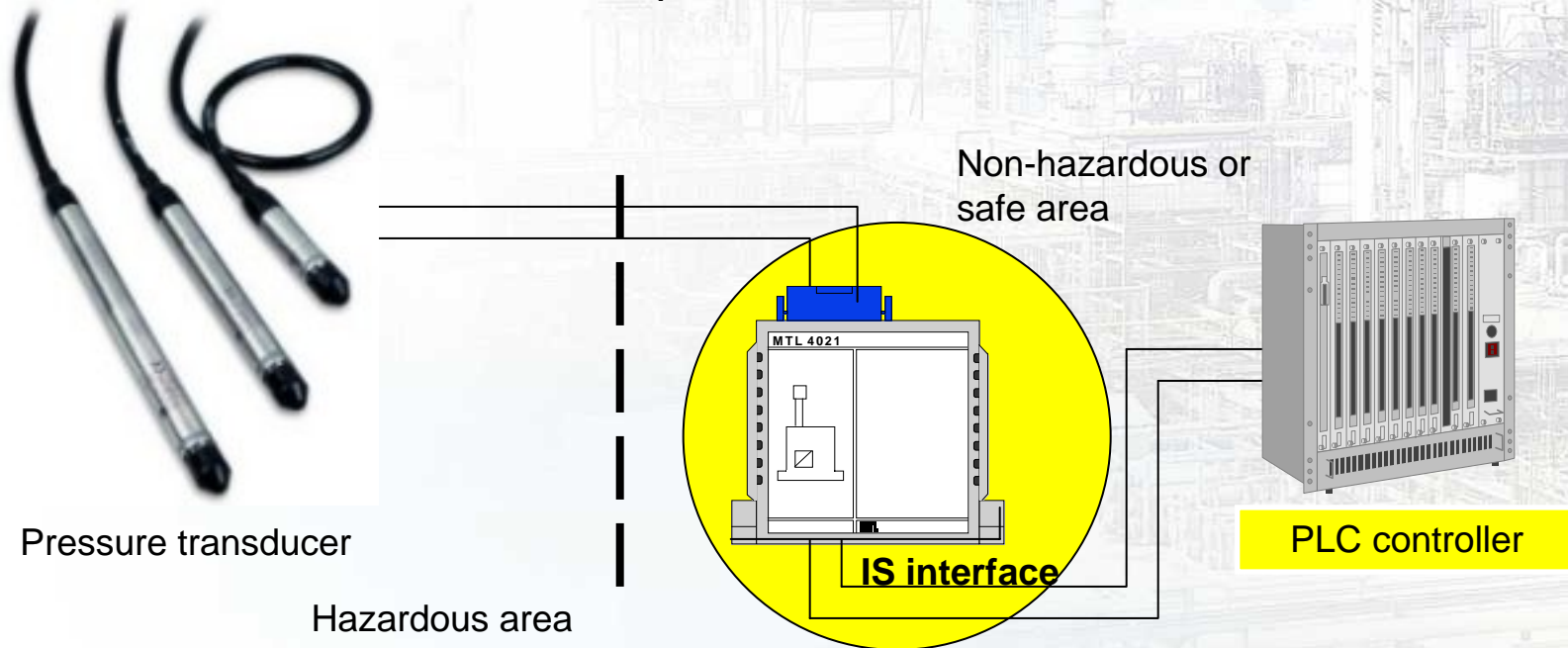
AMSS Mini Fuel Tank Repair Trolley

Another example of Article 1.3(a) Equipment

- also those devices outside of the explosive atmosphere

Chapter 1, **Article 1.2** Safety devices, controlling devices and regulating devices intended for use outside potentially explosive atmospheres.....

Examples - Intrinsically safe associated apparatus (IS interface).
Control device for EEx e motors.
Variable speed motor drives.





Products not covered by the Regulations

- ***Medical devices***
- ***Equipment and protective systems for use in areas where hazard is exclusively from explosives or unstable chemicals***
- ***Equipment intended for use in domestic & non-commercial environments***
- ***Seagoing vessels & mobile offshore units together with equipment and protective systems on board such vessels or units***
(already covered by the IMO Convention)

Products not covered by the Regulations

- ***Personal protective equipment covered by Directive 89/686/EEC***
- ***Vehicles & their trailers intended for transporting passengers and/or goods by air / road / rail / or water networks. Vehicles intended for use in a p.e.a. shall not be excluded (e.g. fork lift trucks etc)***
- ***Equipment specifically designed for military purposes***

Directive 94/9/EC

Safety of Apparatus

Categorisation of equipment
detailed in Annex I



Essential Safety Requirements (ESR) include :
detailed in Annex II

- Principle of integrated safety
- Consideration of environment
- Marking
- Instructions
- Choice of materials
- Potential ignition sources
- Risk caused by software
- Risk from gas, vapours, mist and dust





Directive 94/9/EC

- Group I comprises equipment intended for use in underground mines, and surface installations of such mines, liable to be endangered by firedamp (Methane) and/or combustible dusts
- Group II comprises equipment intended for use in areas other than mining, i.e., surface industries, liable to be endangered by explosive atmospheres

*Groups are then
subdivided into
Categories*

Equipment Groups



Equipment - Group II

Surface Industries

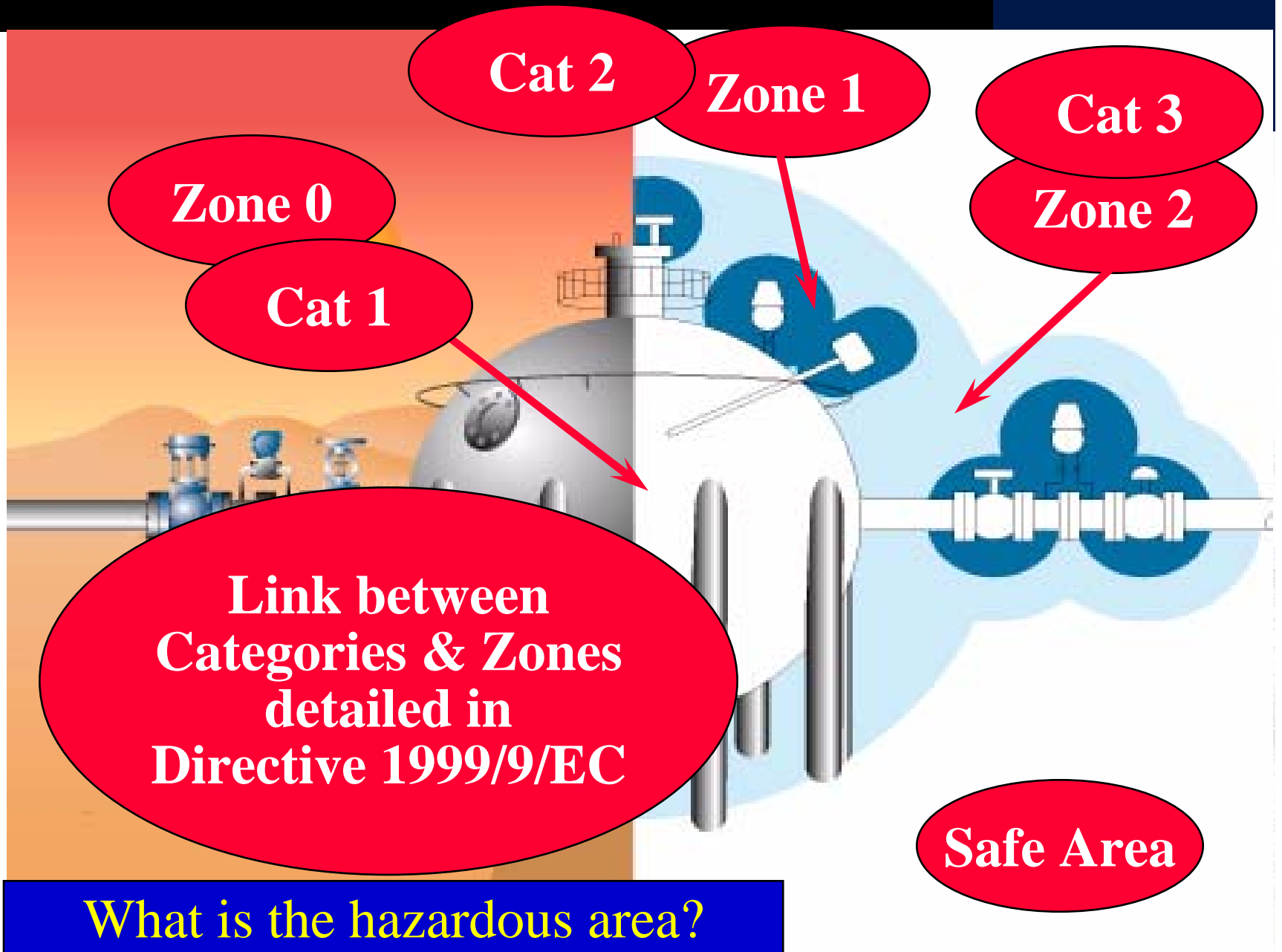
- Category 1 comprises equipment designed to be capable of functioning in conformity with its operational parameters, and ensuring a very high level of protection
- Category 2 comprises equipment designed to be capable of functioning in conformity with its operational parameters, and ensuring a high level of protection
- Category 3 comprises equipment designed to be capable of functioning in conformity with its operational parameters, and ensuring a normal level of protection



Conformity assessment requirements

Directive 94/9/EC

| Equipment category | 1 | 2 Electrical | 2 Non electrical | 3 | Annex of 100a Directive |
|---|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------|
| Certification Phase Certification by Notified Body Certification by manufacturer Unit verification by Notified Body | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | III VIII IX |
| Universal Option | | | | | |
| Surveillance QA of production by Notified Body QA of product by Notified Body QA by manufacturer | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | IV VII VIII |
| Note : Internal combustion engines are electrical equipment Unit verification is normally used for special small quantity apparatus | | | | | |



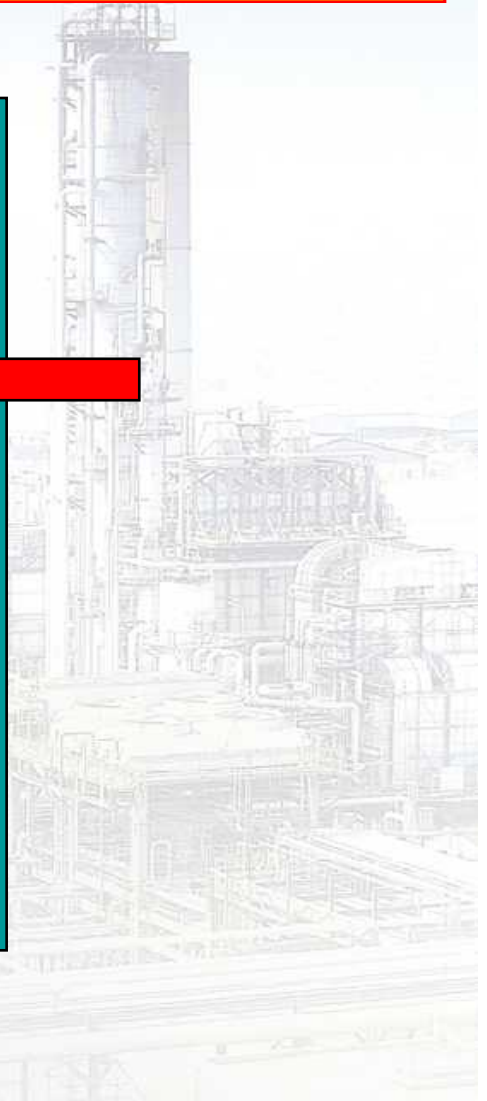
Directive 94/9/EC

Safety of Apparatus

Categorisation of equipment detailed in Annex I

Essential Safety Requirements (ESR) include : detailed in Annex II

- Principle of integrated safety
- Consideration of environment
- Marking
- Instructions
- Choice of materials
- Potential ignition sources
- Risk caused by software
- Risk from gas, vapours, mist and dust



Non-electrical Equipment : Sources of Ignition

■ EN 13463 - 1: 2000

Non-electrical equipment for explosive atmospheres Part 1 : Basic Methodology & Requirements

- *drafts for particular explosion protection concepts for non-electrical equipment are being proposed by the working groups of CEN TC/305 the concepts include :*

| | |
|------------------------------------|-----------|
| <i>flow restricting enclosure</i> | <i>fr</i> |
| <i>flameproof</i> | <i>d</i> |
| <i>inherent safety</i> | <i>g</i> |
| <i>constructional safety (new)</i> | <i>c</i> |
| <i>control of ignition sources</i> | <i>b</i> |
| <i>pressurised</i> | <i>p</i> |
| <i>liquid filled</i> | <i>k</i> |



CENELEC/IEC

E Ex d IIB T6 -40°C < Tamb < +50 °C

Bas 99 ATEX 1234



0600



II 2 G

- ◆ **Additional information on product :**
 - Safety parameters, where applicable**
 - Year of manufacture & Serial No.**
 - Name & address of manufacturer**
 - Manufacturers type identification**

ATEX

Equipment Marking



ATEX

CE 0999  II 1 G

G : Gas, vapour, mist
D : Dust

◆ Type of explosive atmosphere
(Group II)

◆ Equipment Category

M1 : energised
M2 : de-energised
1 : Zone 0, 20
2 : Zone 1, 21
3 : Zone 2, 22

◆ Equipment Group

I : Mining
II : Non-Mining

◆ EU Explosive Atmosphere Symbol

◆ Ref to Notified Body responsible for surveillance

◆ CE mark

Equipment Marking

Directive on the protection of
workers potentially at risk from
explosive atmospheres



Directive 1999/92/EC
ATEX 137 (118a)

Directive 1999/92/EC

Safety of installation

137

- Installation (Safety)
- Risk Assessment
- Hazardous Zones
- Explosion Protection Document
- Criteria for selection of equipment
- Comply by
1 July 2003





Risk Assessment

Directive 1999/92/EC

Should at least include;

Probability of explosive atmosphere

= area classification in to zones

Probability of ignition source including electrostatic discharges

= equipment categories

Nature of flammable materials and interactions

= gas groups, ignition temperature, gas, vapour, mists and dusts

Scale of anticipated effect of explosion

= personnel, environment and plant risk

and risks shall be assessed overall, EN 292 and EN 1050 Safety of Machinery - Principles for risk assessment provides a starting point according to EN 1127-1



Directive 1999/92/EC

Article 7 Places where explosive atmospheres may occur

Classify areas into zones as detailed in Annex I.

Ensure minimum requirements detailed in Annex I are applied to above zones.

Where necessary, mark areas as detailed in Annex III



Directive 1999/92/EC

Article 8 Explosion protection document

This document shall demonstrate;

- explosion risks have been determined and assessed,
- measures are taken to meet Directives aims,
- area classification as Annex I,
- where the minimum requirements set out in Annex II will apply,
- location, equipment, warning devices are designed , operated and maintained with safety in mind



Directive 1999/92/EC

Article 9. Special requirements for work equipment and workplaces.

9.1 Work equipment in use or made available for the first time before 30 June 2003 shall comply from that date with minimum requirements as detailed in Annex II, Part A

9.2 Work equipment for use for the first time after 30 June 2003 shall comply with the minimum requirements as detailed in Annex II, Part A and B

9.3 Workplaces which may contain explosive atmospheres and which are used for the first time after 30 June 2003 shall comply with the minimum requirements as set out this Directive

9.4 Workplaces which may contain explosive atmospheres and which are already in use before 30 June 2003, shall comply with the minimum requirements in the Directive no later than three years after this date

9.5 If, after 30 June 2003, any modifications, extensions or restructuring in work places - shall comply with the minimum requirements set out in this Directive

Directive 1999/92/EC Annex II - B

Criteria for selection of equipment

Zone 0 20
use Category 1 equipment

Zone 1 21
use Category 1 or 2 equipment

Zone 2 22
use Category 1,2 or 3 equipment

**Unless the Explosion Protection Document
specifies or indicates otherwise**





Military Aviation Engineering Policy and Regulations

JAP 100a-01

regulations apply to all personnel engaged in aircraft
and associated equipment maintenance in the MAE

?

Directive 1999/92/EC (ATEX 137)

Directive on the protection of
workers potentially at risk from
explosive atmospheres

**Implementation of the CAD
(Chemical Agents Directive)
and
ATEX (Explosive Atmosphere)
Directives in the UK**



UK only

**Information from
Safety Policy Directorate
HSE**



UK only

- The Chemical Agents Directive requires employers to protect workers from certain risks from chemical agents in the workplace.
- The Directive is concerned with health risks in all industrial sectors.

- The Explosives Regulations requires employers to take measures to protect workers from the risk of explosion.
- UK have implemented CAD & ATEX together in new safety regulations known as; The Dangerous Substances & Explosive Atmosphere Regulations (DSEAR)

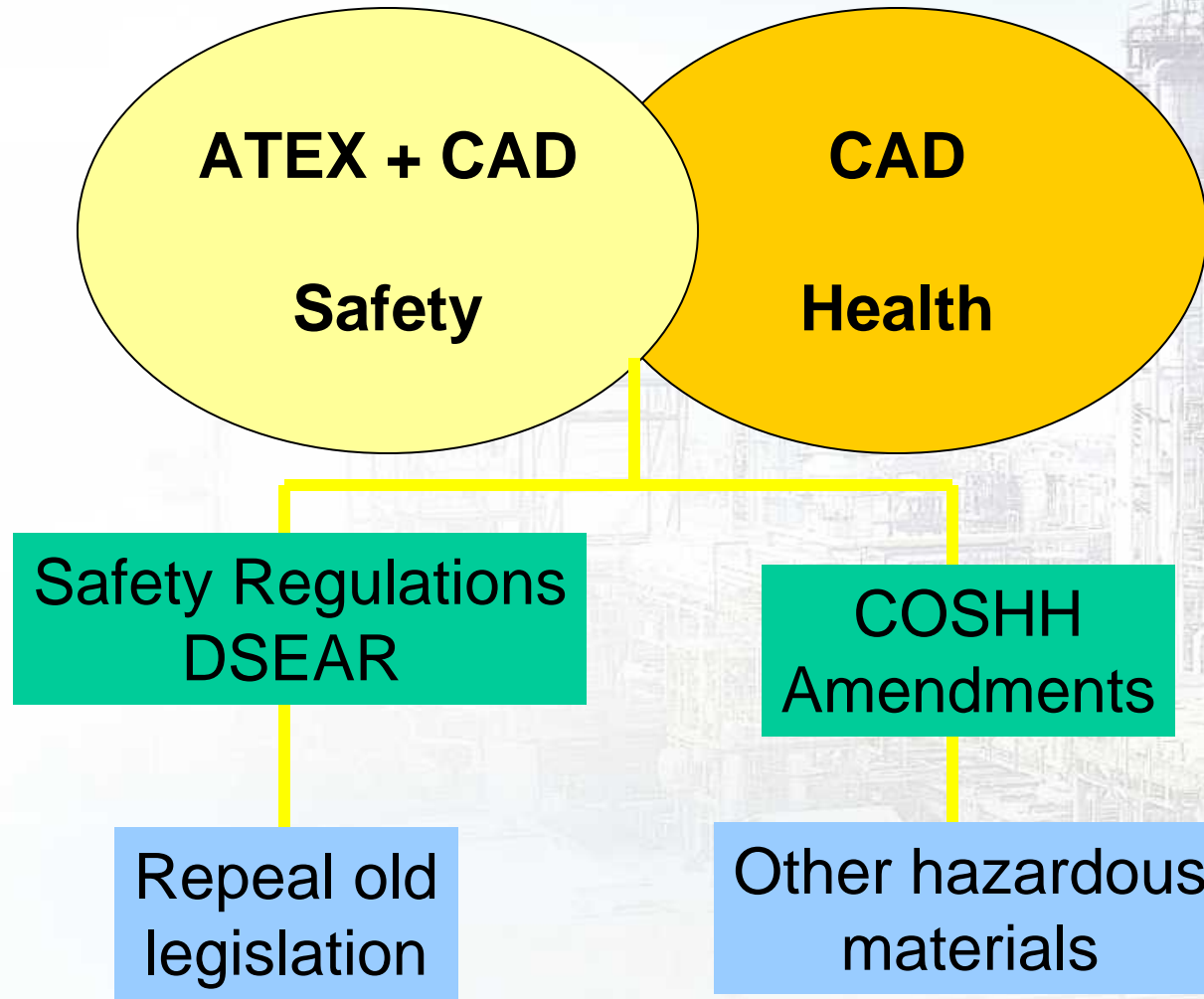
The substance or dust must be present in sufficient quantities to create an explosive atmosphere there is considerable overlap between CAD and ATEX.

CAD & ATEX

Implementation strategy -



UK only



COSHH - Control of Substances Hazardous to Health Regulations

DSEAR requires employers to;-



UK only

- Carry out a risk assessment before commencing any new work activity involving dangerous substances
- Record before commencing the work activity the significant findings of the assessment, (this takes the place of the Explosion Protection Document?)
 - the measures taken to reduce risk
 - sufficient information to show that the workplace will be safe during operation,
 - including details of hazardous area zones
(From June 2003)
 - arrangements to deal with accidents & emergencies
 - measures taken to inform, instruct & train employees



ATEX Website

Under the control of European Commission - Directorate-General Enterprise

<http://europa.eu.int/comm/enterprise/atex/index.htm>

This site contains the following; -

Equipment for use in potentially explosive atmospheres

Directives (Old Approach)

Directive 94/9/EC (New Approach)

Directive 1999/92/EC

Guidelines on Directive 94/9/EC

Considerations by the ATEX Standing Committee

Notified Bodies

- List of Notified Bodies
- ExNBG Clarification Sheets noted by the Atex Standing Committee
- ExNBG HOTL Decisions noted by the Atex Standing Committee

Standardisation

Working structure within EU

PECAs

Also

<http://www.dti.gov.uk/strd/atex.html>



Thank you for your attention

Questions

