

PRACTICAL HAZARDOUS AREAS FOR ENGINEERS AND TECHNICIANS



YOU WILL LEARN HOW TO:

- Demonstrate a good understanding of the terminology used with hazardous areas
- Design and install safe working systems in hazardous areas
- Assist in hazardous area classification
- Detail the types of apparatus that can be used in a given hazardous area
- Demonstrate a good understanding of the basic hazards associated with electricity near flammable gases and vapours
- Explain the types of equipment that can be used
- Understand safety and operational aspects of hazardous areas
- Understand system limitations in using hazardous areas protection
- Detail the key areas of the national codes of practice
- Understand the basics of explosion protection to IEC standards

WHO SHOULD ATTEND:

Anyone involved in design, specification, installation, commissioning, maintenance or documentation of industrial instrumentation, control and electrical systems, including:

- Tradespersons working in Potentially Explosive Atmospheres (PEAs)
- Electrical and instrument tradespersons
- Instrumentation and control engineers
- Electrical engineers
- Instrumentation technicians
- Design engineers



The Workshop

This workshop provides you with an understanding of the hazards involved in using electrical equipment in potentially explosive atmospheres. It is based on the international IEC79 series of standards that are now replacing the older national standards. Installation utilising Explosion-Protected (Ex) equipment can be expensive to design, install and operate. The wider approaches described in these standards can significantly reduce costs whilst maintaining plant safety.

The associated terminology and its correct use are explained throughout the workshop. It covers area classification, selection of explosion protected electrical apparatus as well as describing how protection is achieved and maintained in line with these international requirements. Standards require that engineering staff and their management are trained effectively and safely in hazardous areas and this workshop is designed to help fulfil that need.

Practical Sessions

This is a practical, hands on workshop enabling you to work through practical exercises which reinforce the concepts discussed.

The Program

BACKGROUND TO HAZARDOUS AREAS

- Explosion consequences
- Nature of hazards
- Definition of hazardous area
- Flammability concepts
- Ignition sources
- Properties of gases, vapours, mists and dusts
- Introduction to types of protection

CLASSIFICATION SYSTEMS

- Source of release
- Area classification into zones
- Equipment (apparatus) grouping
- Temperature classification and ambient rating
- Summary of principles of Ex protection
- Equipment protection levels

TYPES OF PROTECTION

- Definitions
- Principles
- Application of:
 - Flameproof: Ex d
 - Increased safety: Ex e
 - Pressurisation: Ex p
 - Intrinsic safety: Ex i
 - Non-incendive: Ex n
 - Oil filling: Ex o
 - Powder filling: Ex q
 - Encapsulation: Ex m
 - Special: Ex s

EARTHING AND BONDING

- Basic principles
- Earthing requirements
- Static protection
- Lightning protection
- Noise and interference control
- Requirements for IS systems
- System earthing approach

CODE OF PRACTICE FOR SELECTION AND INSTALLATION OF EX EQUIPMENT

- Application of code of practice
- General requirements for all types of protection
- Documentation requirements and the verification dossier
- Cabling
- Overview of requirements for individual Ex protection types
- Dust installations overview

INSPECTION AND MAINTENANCE REQUIREMENTS

- Inspection and maintenance definitions
- Types of inspection
- Initial detailed pre-commissioning
- Inspection regimes and documentation
- Record keeping

FAULT FINDING AND REPAIRS OF EX EQUIPMENT

- Planned maintenance
- Use of tools
- Procedures
- Safe methods
- Test equipment suitability

STANDARDS, CERTIFICATION, CERTIFICATES, MARKING AND APPROVALS

- Authorities
- Marking and identification
- Component certification
- Equipment certification
- Systems certification
- Systems descriptive documentation (for Ex i)

ATEX DIRECTIVES

- Introduction and explanation (European requirements)
- Non-electrical ignition-capable equipment protection
- ATEX marking
- DSEAR (UK) requirement summary

SUMMARY, OPEN FORUM AND CLOSING

