Training Program:

Safe Handling, Operation And Maintenance Of Electrical Equipment

Introduction:

Preventing the unintentional ignition of explosive atmospheres is a critical safety and economic aspect of all petroleum and chemical plant operations.

The course focuses on how to Identify and quantify the hazardous areas, how to Select appropriate electrical equipment and instruments for those areas and how to recognize the different methods of protection and how they work. It also gives a detailed explanation on how to Install, inspect and maintain the certified equipment

Who Should Attend?

Safety Practitioners, Electrical Engineers, Instrumentation Engineers, Technicians

Course Objectives:

By the end of this course delegates will be able to:

- Provide a clear understanding of hazardous area current custom and practice with particular respect to the following
- Defining the hazard, classifying hazard materials, understanding the nature of the risk and the necessity to eliminate sources of ignition
- The relationship between electrical equipment and gas groups and temperature classes
- The installation and maintenance of the different types of equipment i.e. flameproof, increased safety, intrinsic safety etc.
- The need for, and typical approach to, electrical equipment inspection
- The documentation of the hazardous area

Accreditation:

BTS attendance certificate will be issued to all attendees completing a minimum of 80% of the total course duration.

Course Outline

Introduction and History

- A brief history of Industrial fires and explosions
- Materials
- Understanding the important characteristics of hazard materials and how they behave when they are ignited. Looking at the data tables and seeing how, Flash point, boiling point, etc. influence our approach to the materials
- Area Classification
- A look at the techniques and the procedures that result in the formal allocations of zones zero, one and two
- Sources of Hazard, duration of release, extent of zones, calculations, nature of hazard and release characteristics

Area Classification Exercise

- Apparatus Groups and Temperature Classes
- How apparatus and hazard materials are matched together in terms of ignition energies, flame transmission characteristics and ignition temperatures. How groups and T Classes have changed over the years and from country to country and where to find the information to make comparisons
- Source of Ignition

- A look at some of the possible sources of ignition, e.g. static electricity, light metal thermite reactions, friction etc., which can occur in hazardous areas. Also considering some of the steps which can be taken to eliminate them
- Methods of Protection
- Flameproof , Intrinsic Safety, Increased Safety, Pressurized

Equipment Inspection

- Examining samples and answering questions about them
- Intrinsic Safety
- As for flameproof, an in depth look at the subject considering minimum ignition energies, associated apparatus and systems, simple apparatus, IS clean earth, floating systems, system matching
- Intrinsic Safety Installation
- Segregation of cables, screens and armour, earthing and bonding
- Induction and invasion, creep age and clearance, Increased Safety

Pressurized Apparatus

- A close examination of this method of protection, what it can be applied to, when certification is possible and how to maintain it. Where pressurized rooms fit in and how uncertified pressurized enclosures may be used in zone 2
- A thorough examination of type N considering non-sparking, enclosed break, energy limitation, and restricted breathing concepts. Also making comparisons with the concepts of protection already covered in detail
- The Less Common Types of Protection
    - Labels, Marking and Certificates

Installation, Inspection and Maintenance

- Considering the guidance of National codes of practice in terms of wiring and cabling, identification, isolation, inspections and maintenance.
- Examining inspection schedules and referring back to the concepts of protection to ensure that the attendees are comfortable with the inspection requirements for all types of equipment.
- Cable entries, Equipment Inspection, Legislation
- What the Law has to say, standards, certificates, codes, European directives, the HSE and how it all ties together