



Training Program:

NEC Hazardous (Classifieds) Locations

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Introduction:

This course is designed to provide the participant with an understanding of the characteristics of flammable materials, classification of hazardous locations, types of equipment used in hazardous locations, typical wiring systems, and inspection and maintenance guidelines.

Hazardous areas exist in many industrial and commercial facilities where process information is gathered using sensors, switches, and manually operated controls. Hazardous conditions can exist during normal daily operations as a result of the release of flammable materials into the atmosphere. Releases can occur due to leaks at valves and pipe flanges, from routine maintenance where a seal is being replaced, or where a process results in the regular escape of gases and vapors.

In many jurisdictions, either government or company mandated training is required for personnel working in these environments. There are many occupations and workers employed in this sector of industry that are affected by the safety requirements for working in hazardous locations.

Upon completion of this course participants will have an understanding of the hazardous conditions associated with working in industrial and commercial oil and gas production facilities.

Who Should Attend?

This course is mainly targeted to electrical and instrumentation technicians working in the field as an introduction or refresher. The course can also be applicable to

employees working with equipment purchasing, procurement, storage, and job planning, as well as immediate supervisors to the working technicians.

Course Outline

Day 1

Nature and Grouping of Flammable Gases

- Sources of ignition
- Flashpoint
- Ignition temperature

The topic of the first day will cover the basic characteristics of flammable materials, as they relate to the installation of electrical equipment in hazardous (classified) areas where gases, vapors, and liquids are present. Participants will learn about fire triangles, flammable limits, and gas density. Electrical equipment is specially designed and chosen for these areas. An exceptional understanding of these basic characteristics will be necessary in order for electrical and instrumentation personnel to appreciate the selection and installation requirements for electrical apparatus.

Day 2

Hazardous Area Classification

- Hazardous Location Classification (NEC)
- Hazardous Location Classification (IEC)
- Grouping of gases

- Temperature classifications

On day two, participants will learn about methods used to classify hazardous areas and the hazards associated with these areas, including flammable gases or vapors, combustible dusts, or ignitable fibers. The day will continue with a discussion of the different systems used in Europe and the United States to classify the type of hazard and whether the hazard is always present or only present in an emergency condition, such as a spill or failure of ventilating equipment.

Day 3

Electrical Enclosure Protection Methods and Marking

- Equipment identification
- Apparatus label marking
- Flameproof enclosures

This day will cover suitable electrical equipment for use in hazardous areas and the associated nomenclature and codes. This will include flameproof (Ex "d") and explosion proof apparatus, increased safety (Ex "e"), intrinsic safety (Ex "ia", Ex "ib"), pressurization (Ex "p"), and Ingress Protection (IP) Codes – IEC. Discussion will include the objective of selecting electrical equipment and the means of installation to reduce the hazard of the electrical apparatus to an acceptable level.

Day 4

Wiring Systems for Hazardous Areas

- Types of cables suitable for hazardous areas
- Types of cable glands

- Wiring methods for flameproof equipment
- Wiring methods for intrinsically safe equipment

On day four, the focus will be on wiring systems used in hazardous areas in industrial facilities and how technicians perform the same functions in the non-hazardous (safe) areas of those same plants. Information from telecommunication, instrumentation, and control systems run from safe areas to hazardous areas will be covered. Participants will gain an understanding of the wiring systems that travel within the different classified areas, as well as the relevant installation codes and practices.

Day 5

Inspection and Maintenance

- Inspection and maintenance of flameproof installations
- Inspection and maintenance of IS installations

The final day will focus on the typical inspection and maintenance check lists for the electrical apparatus used in hazardous locations according to recognized practices and manufacturer's recommendations. The emphasis of the last day will be to provide attendees with an understanding that apparatus will only remain approved or certified if it is maintained in accordance with the recommendations provided by manufacturers and the relevant construction standards.

Accreditation:

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