

Installing Electrical Equipment in Dangerous Areas

Classification, Operation & Maintenance, Safe Handling

Introduction

An essential component of all petroleum and chemical plant operations, both economically and safety-wise, is preventing the unintended ignition of explosive atmospheres.

This Course N Carry training session will teach you the following skills:

- Determine and Measure the Dangerous Zones
- Choose the proper instruments and electrical equipment for such regions.
- Understand the various protection strategies, such as Ex d or Ex ia, and how they operate.
- Install, Examine, and Continue to Maintain the Approved Equipment

Objectives

Attendees of the training seminar on Course N Carry will:

- Give a thorough explanation of the present customs and practices in hazardous areas, paying special attention to the following:
 - Identifying the risk, categorising hazardous products, defining the hazard, and realising that it's important to remove ignition sources
 - The connection between the many kinds of Ex equipment and region classification
 - The connection between temperature classes, gas groups, and electrical equipment
 - The setup and upkeep of various equipment kinds, such as intrinsic safety, enhanced safety, and flameproof equipment.
 - The necessity of electrical equipment inspection and its standard procedure
 - Recording of the Dangerous Region
- The goal of this Course N Carry training session is to provide:
 - A thorough comprehension of hazardous areas from the outset of the issue
 - A few case studies of industrial accidents that involved the usage of protective equipment, danger classification and identification, and equipment selection
 - The management of hazardous areas with regard to certifications and record keeping

Training Methodology

Understanding hazardous areas and accepted operating practices is the goal of this Course N Carry Installing Electrical Equipment in Dangerous Areas training course. Throughout the training session, participants are actively urged to participate and to

have discussions.

Organizational impacts

In EU member states, taking this Course N Carry Installing Electrical Equipment in Dangerous Areas training course is legally required; however, it is optional in GCC member states. Companies in the GCC will be up to date on the most recent international requirements for Hazardous Area training by offering this training to their staff.

- Global best practices for preventing explosions
- Internal capacity to evaluate and update the classification of Hazardous Areas
- Equipment chosen appropriately for zones 0, 1, and 2, which reduces costs
- Internal capacity to examine and assess current equipment

Personal Impact

- Increased knowledge of explosive risks, their causes, and self-defence techniques
- Knowledge of temperature classes, apparatus groups, and zones
- An enhanced understanding of the process of classifying hazardous areas and determining the characteristics and extent of these zones
- Recognising the connection between equipment that can be placed in combustible zones and those materials
- The capacity to interpret and read certification labels

Who should attend?

This five-day Course N Carry training course consists of formal lectures, hands-on training, demonstrations, and written exercises. It is a single, all-inclusive training package.

Its main objective is:

- When dealing with potentially explosive environments or hazardous areas, engineers and technicians must prioritise safety, electrical systems, and instrumentation.
- The majority of participants are expected to have some experience with industrial electrical practice, while prior understanding of hazardous areas is not required.

Course Outline

Day 1

Overview and Background

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- A Synopsis of Industrial Explosions and Fires in History Materials
- Being aware of the key traits of hazardous materials and how they react when set on fire.
- Observing the data tables and noting how the materials' L.E.L., flash point, and boiling point affect our handling of them
- Classification of Areas
- An examination of the methods and processes that lead to the official designation of zones zero, one, and two Sources of Hazard, as well as the length of the release, the size of the zones, the computations, the type of hazard, and the features of the release

Day 2

Temperature Classes and Equipment Groups for Area Classification

- How are the ignition temperatures, flame transmission properties, and ignition energies of the device and the hazardous materials matched? How have T Classes and groups evolved over time and across national borders, and where can I locate the data I need to compare things?
- Origin of Flame
- An examination of some of the potential ignition sources that can happen in hazardous areas, such as friction, light metal thermite reactions, static electricity, etc.
- Taking into account some of the actions that can be done to get rid of them as well
- Techniques for Defence
- Taking into account the accepted protective techniques. The main idea in each situation and the areas where they could be used
- Ex d Flameproof
- Ex i: Safety from Within
- Ex e Better Safety
- Ex p. Under Pressure
- Ex N Category N
- Exercise m, Ex o, Ex q, and Ex s
- Example d Not flammable
- Examining in detail the idea of flameproof protection, including how it operates, how to install it, and how to maintain, inspect, and inspect it. Examining fasteners, gaps, corrosion, weatherproofing, etc.

Day 3

Exercise 1: Equipment Inspection Examining samples and responding to inquiries about them

- Intrinsic Safety
- Regarding flameproof, a thorough examination of the topic should take into account minimal ignition energies, related equipment and systems, basic equipment, IS clean earth, floating systems, system matching, etc.
- Installation of Internal Safety

- Cable, screen, and armour separation, bonding and earthing, infiltration and incursion, creepage and clearance, etc.
- Enhanced Security
- A thorough examination of this idea of protection that draws parallels with flameproof technology and emphasises how crucial proper installation is. Examining weatherproofing IP rating, CTI, derating, stoppers and bolts, etc.
- Inspection of Equipment

Day 4

Example of Pressurised Equipment

- A thorough analysis of this protective technique, including its applications, certification scenarios, and maintenance requirements.
- How uncertified pressurised enclosures may be used in zone 2 Type N and where pressurised rooms fit in
- A detailed analysis of type N taking into account confined breaks, energy limitation, non-sparking, and restricted breathing concepts. Moreover drawing parallels with the protective ideas that have already been thoroughly discussed
- The Less Frequently Used Protection Methods
- Examining Ex m, Ex o, Ex q, and Ex s while highlighting the elements that are crucial to safety and taking each one in turn. Taking into account dual or combined
- Certification as well as the fusion of numerous protection ideas into a single piece of equipment
- Inspection of Equipment
- Certificates, Markings, and Labels
- A review of the certification numbers, codes, and other pertinent markings found on labels and certificates. Including a task on paper for equipment identification

Day 5

Setting up, Examining, and Maintaining

- Taking into account the recommendations provided by national codes of practice for maintenance, identification, isolation, wiring and cabling, and inspections.
- Making sure that everyone in attendance understands the inspection requirements for all kinds of equipment by looking over inspection schedules and going over the protection concepts again. Prioritising repairs means deciding which malfunctions are now life-threatening and which may eventually become so.
- Cable ports
- Taking into account conduit and cable entry for all kinds of enclosures and security ideas. Examining connectors, reducers, and adapters as well as making the appropriate choice for each situation
- What is stated in the law, and how does it relate to standards, certifications, codes, European directives, and the HSE?

- Taking into account the documents that ought to kept by a company in order to manage a Hazardous Area installation
- General Discussion