Electrical Defence

Features, Types, and Applications of Protection Relays

Introduction

The essential and crucial components of electrical installations will be covered in the Electrical Protection training course. Protection is implemented component by component. Every major component in the power distribution system has a relay connected to it in order to detect different types of distress related to that component. The malfunctioning system components are isolated if one of those relays activates, which indicates that an output contact protection mechanism is in place. It might be easier to imagine the circuit breaker as the muscle that isolates the component, and the relay as the brain that determines when isolation is necessary.

Among the highlights of this Course N Carry Electrical Defence training course are:

- Principles and Types of Operational Electrical Protection:
- Design of Various Relays
- Types of Protection Architecture
- Coordination of Protection

Objectives

After completing this training programme in electrical protection, you will be able to:

- Thank you for providing useful guidance on selecting the appropriate kind of electrical protection.
- Gain a thorough understanding of the concepts and how to choose relays.
- Create a protective scheme design.
- Understand the design and operation of instrument transformers.
- Describe the many types of earthing fault protection and grounding systems.

Training Methodology

A copy of the extensive training course handbook will be given to each participant in the course. The interactive nature of this Course N Carry Electrical Defence training is intended to increase delegate engagement. It is encouraged to ask questions throughout and throughout the daily sessions. The speaker will go over particular issues

and suitable fixes. In order to guarantee that all attendees are paying close attention to the training, very minimal note-taking is advised.

Organizational impacts

This Electrical Defence training course offers the best means of meeting staff members' technical training needs. The advantages for the company can be summed up as follows:

- Upskilling and technical training are necessary to enhance and maximise the capabilities of a skilled workforce.
- Increasing productivity by cutting down on project acceptance, design, and commissioning time
- Finding areas for development as a result of a thorough comprehension of the cutting-edge technologies being provided
- Connecting staff members with experts in technology and other highly skilled engineers and technicians in the field
- Exposure of staff to worldwide standard operating procedures
- A shift in the workforce's mindset as a result of constant exposure to new technology that they can handle could otherwise result in a workforce that is highly resistant to change because of ignorance

Personal Imapct

After completing this Electrical Defence training course successfully, participants will be able to:

- To comprehend the many forms and causes of electrical malfunctions to comprehend the several kinds of fuses, circuit breakers, and protection relays that are found in LV and MV electrical systems
- To comprehend the functions and varieties of protection relays, such as numerical, solid-state, and micro-logic relays
- Installing and choosing the appropriate kind of relays for certain tasks
- Typical protection relays for transformers, motors, feeders, and switchboards
- Impact and computations of different types of short circuit currents

Who should attend?

Following successful completion of this Electrical Defence training course, learners will be qualified to:

- Understanding the many types of fuses, circuit breakers, and protection relays that are used in LV and MV electrical systems; to appreciate the various manifestations and reasons of electrical problems
- To understand the uses and types of protective relays, including micro-logic, solid-state, and numerical relays

- Installing relays and selecting the right sort for the job
- Common protective relays for switchboards, feeders, transformers, and motors
- Effects and calculations of various short circuit current types

Course Outline

Day 1

Types of Faults and Electrical Protection Devices

- Electrical Protection and Control Devices Are Important
- Electrical Fault Types
- High Voltage Fuses' Features for Electrical Protection
- Features of Electrical Protection Circuit Breakers
- Relays for Microprocessor Overcurrent
- Discrimination Using Time, Current, Curves, and Logic
- Temperature-Dependent Trip Curves
- LV Protection of Switchboard Against Short Circuit

Day 2

Transformers for instruments and protection functions

- Architecture of the Power System: Protection Functions
- Particularised Coordination
- Relays for lockout and anti-pumping
- Sensors
- Transformers for Instruments of Current and Voltage
- Relay Types
- Numerical Functions and Relays

Day 3

Protection Systems for Motor, Transformer, and Busbar

- Protection for Busbars
- Protection of Transformers
- Type of Related Faults: Motor Protection, Capacitor Protection, Overhead Line Protection
- Important Protection Roles
- Coordination of protective devices

Day 4

Protection from Earth Faults and Grounding Systems

- Protection Against Overcurrent in Phase and Earth Faults
- Schemes for Unit Protection
- Protecting Distance
- Feeder protection against short circuit and overload
- Different Grounding System Types
- Limited Earth Fault Defence
- Delicate Earth Fault Defence
- Defence Against Overvoltage

Day 5

Techniques for Commissioning Relays, Calculating Short Circuit Current, and Understanding Harmonics

- Setting up the Protective Relays
- Short Circuit Current Calculation
- Topologies of Faults
- Current Short Circuit at Fault Point
- Systems of Positive, Negative, and Zero Sequence
- Effects of Triplen Harmonics and Their Mitigation Strategies
- Final Question and Answer Session