PRACTICAL ELECTRICAL WIRING STANDARDS (STANDARD AS / NZS 3000)

WHAT YOU WILL LEARN:
- Identify the various sections and requirements of the standard
- Understand these requirements and apply them in their day-to-day functioning
- Appreciate the importance of fulfilling the requirements for safe use of electrical equipment and systems
- Have a clear knowledge of earthing and its importance in safety
- Make simple calculations to check the adequacy of conductors and protective earthing components to ensure safe operation
- List the periodic checks and verification measures to be carried out in an electrical installation as mandated by the standard

WHO SHOULD ATTEND:
- Instrumentation and Control Engineers
- Consulting Engineers
- Electrical Engineers
- Project Engineers
- Maintenance Engineers
- Electrical Contractors
- Safety Professionals
- Consulting Engineers
- Electricians
- Electrical Inspectors
- Power System Protection and Control Engineers
- Building Service Designers
- Data Systems Planners and Managers
- Electrical and Instrumentation Technicians
The Workshop

This workshop aims to familiarise the participants with the requirements laid down in the standard AS/NZS 3000, commonly known as Australia-New Zealand Wiring Rules. For those installations covered in the scope of this standard, its provisions are mandatory and must be followed. Any engineer involved in planning and design of electrical systems, their installation or maintenance must have a clear idea about the various requirements contained in the standard. The primary purpose of this standard, like many of its various other equivalent national standards, is to ensure the safety of personnel against the dangers arising from the use and handling of electrical equipment and appliances.

The introductory modules of this workshop outline the basic principles that should be understood for a better appreciation of the standard. These include modules which illustrate the calculation for the power demand of a system and the computation of earth fault currents as discussed in the appendices of the standard. These are informative in nature and are very important in making an electrical system safe for operation. The actual provisions of the standard are then discussed in detail in the subsequent modules.

Pre-requisites

A working knowledge of basic electrical engineering principles is required. Experience in planning, installation and maintenance of electrical equipment and systems will enable the workshop to be placed in context.

Practical Sessions

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

To gain full value from this workshop, please bring your laptop/notebook computer.

DAY ONE

INTRODUCTION AND OVERVIEW
- Brief scope and contents of Australian Wiring Rules (AS/NZS 3000)
- Evolution of electrical distribution systems
- Selection and installation of electrical equipment and safety considerations
- Selection and installation of wiring systems
- Earthing and its importance in safety
- Testing and verification
- Precautions for special locations

INSULATION OF ELECTRICAL SYSTEMS AND ITS ROLE IN SAFETY
- Functions of electrical insulation
- Air as an insulator
- Solid and liquid dielectrics
- Insulation class and temperature ratings
- Current limits of conductors based on insulation
- Role of electrical protection
- Calculating the demand of electrical systems for proper conductor sizing (as per AS/NZS 3000 Appendix- C)

Practical Work - Calculations

EARTHING OF ELECTRICAL SYSTEMS
- The need for earthing of electrical systems
- At the source (system earthing)
- At the load (protective earthing)
- Methods adopted for system earthing
- Shock hazard by direct and indirect contact
- Protective conductor
- Equipotential bonding
- Avoiding direct and indirect contact hazards

EARTH FAULT DETECTION AND PROTECTION
- Earth fault sensing methods
- Calculation of earth fault current
- Earth fault loop impedance
- Limits of LV feeder lengths for proper earth fault detection (as per AS/NZS 3000 Appendix- B)

Practical Work - Calculations

DAY TWO

SELECTION AND INSTALLATION OF WIRING SYSTEMS
- Types of wiring systems
- External influences
- Current-carrying capacity
- Sizing of conductors
- Voltage drop considerations in sizing
- Electrical connections
- Identification of wires and cables
- Installation
- Enclosure of cables
- Underground wiring systems
- Aerial wiring systems
- Cables supported by a catenary
- Emergency systems
- Busbar trunking systems and rising mains
- Earth sheath return system

GENERAL REQUIREMENTS OF INSTALLATION
- Electrical equipment requiring protection against injury from mechanical movement
- Protection against thermal effects
- Protection against explosion
- Installation requirements of transformers, capacitors etc.
- Alternative and emergency power supply systems
- Connection of electrical equipment

REQUIREMENTS OF THE STANDARD

TESTING AND VERIFICATION REQUIREMENTS OF THE STANDARD
- Visual inspection
- Testing

REQUIREMENTS FOR SPECIAL ELECTRICAL INSTALLATIONS OR LOCATIONS
- Locations containing baths, showers or other fixed water containers
- Swimming pools, paddling pools and spa pools or tubs
- Locations containing sauna heaters
- Refrigeration rooms
- Locations where general hosing down operations are carried out
- Fountains and water features
- Extra-low voltage electrical installations
- High voltage electrical installations
- Hazardous areas
- Emergency systems

SUMMARY AND OPEN FORUM

COMPLETE FEEDBACK SHEETS

CLOSING

On-Site Training

✔ SAVE over 50% by having an IDC workshop presented at your premises.
✔ Customise the training to YOUR workplace.
✔ Have the training delivered when and where you need it.

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