

## Traction Power System

### **DAY 1**

#### **Introduction to and Requirements for Traction Power and/or Supply Systems**

- History of Electric Traction
- Modern Electric Trains
- Requirements for Traction Power Systems
  - Bulk Supply Substations (BSS)
  - Traction Substations
  - Power Distribution Network
- Parameters to be considered in the Design
  - Safety
  - Reliability
  - Availability
  - Maintainability

### **DAY 2**

#### **Traction Supply Systems**

- Direct Current (DC) System
  - Nature of Traction Load
  - Means to Reduce Harmonics
  - Automatic Assured Receptivity Unit
  - Stray Current
  - Touch Voltage
  - Over Voltage Protection
- Alternative Current (AC) System
  - Single Phase
  - 3 - Phase
  - Interference and Induction
  - AC Traction Supply Feeding Method
    - Booster Transformer Feed
    - Direct Feed
    - Auto - Transformer (AT) Feed
    - Co-axial Cable Feed

### **DAY 3**

#### **Track Electrification – 1 (Overhead Catenary System)**

- Design Consideration
- Overhead Catenary System
  - Simple Construction
  - Simple Catenary
  - Stitched Catenary
  - Compound Catenary
  - Major Components
  - Supports
  - Cantilever
  - Stagger
  - Wires
  - Sectioning
  - Tensioning
  - Section Insulator
  - Phase Break / Neutral Section

### **DAY 4**

#### **Track Electrification – 2 (Rigid Conductor System, 3rd Rail System, Track Embedded Coil)**

- Rigid Conductor System
  - Support on Soffit
  - Components (*By Saitong Railway Electrification*)
  - Installation
- Conductor Rail System (*3rd Rail System*)
  - Top Running Conductor Rail
    - Steel Rail
    - Composite Rail
  - Ramp
    - High Speed Ramp
    - Low Speed Ramp
    - Side Entry Ramp
  - Conductor Rail Joint
  - Expansion Joint

- Mid-point Anchor
- Cable Termination Assembly

## **DAY 5**

### **Long Stator Winding on Guideway and Conclusions**

- Power Supply to Stator Sections Embedded in Guideway
- Long Stator Winding Linear Motor Principle
- Propulsion System
- Conclusions
  - Basic Requirements of the Traction Power Supply for a Railway Network
  - Types of Traction Supply and the Major Components
  - Overhead Catenary System
  - Conductor Rail System