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# FUNDAMENTALS OF SMART METERING



## WHAT YOU WILL LEARN:

- Need for Smart Metering
- What Smart Metering means
- How to implement a Smart Metering system
- Technologies used in Smart Metering
- Components in a Smart Metering system
- What Smart Meter Data Management means

## WHO SHOULD ATTEND:

This course is designed for personnel who want to understand the design and engineering principles involved in Smart Metering. Those who will benefit the most from this workshop include the following:

- Metering Project Directors / Manager / Supervisors
- Distribution Managers
- Energy Managers
- Energy Marketers
- Marketing Managers
- Tariff Managers
- Facilities Managers
- Billing Managers
- Energy Service Providers
- Technical Managers Business Development Managers
- Data and MDM Directors / Managers /Supervisors
- Customer Service Directors / Managers / Supervisors
- IT professionals within utilities (senior and middle-management)
- Commercial people within utilities
- Regulators / Commissioners
- Head of Electricity, Water, Gas Unit
- Regulatory Affairs Directors / Managers / Supervisors

## The Workshop

Smart Metering is a technique used to meter the energy consumption in more detail than a conventional meter. The increasing cost of energy has put power consumption firmly on the political radar. It is one of the factors driving the adoption of smart metering technology.

By replacing traditional passive meters with networks of user-friendly smart meters, consumption of power, gas and water can be monitored. Smart meters provide complete, detailed, real-time information on end users' consumption patterns—allowing to bill more accurately for the energy used, and giving the customers the opportunity to change their behavior (and save money in the process). The technology enables data to be sent from the utility to the customer, meaning tariffs can be changed dynamically, for instance during periods of peak usage, in order to encourage reduced consumption.

Smart meter systems establish two-way data communication between customer sites and the central systems, paving the way in future for direct control and fine-grained management of the supply of energy, gas or water.

Data generated by smart meters includes information of the utility such as time of use, tariffs, tampering and outage detection.

Smart metering is part of a growing global trend towards intelligent technology in the utilities industry. Smart meters help to save energy and reduce greenhouse gas emissions. This technique supports services that improve the energy efficiency and the energy consumption of the energy system (generation, transmission, distribution and especially end use). This is important as there is a big debate about climate change these days and a high demand for energy efficiency. The smart direction is to come to an efficient energy market. A smart meter can get an efficient energy market, which can on an hourly or on a per-second basis match supply and demand.

The objective of this course is to learn the implementation of smart metering for domestic and business places and to learn to design smart homes and smart premises using this technique. The course also introduces the participants to the new methods adopted and the implementations of smart metering done across the globe by different countries.

This course will cover the methods and concepts used in Smart Metering. The technologies used to handle data from smart meters and the new software utilities to handle the reading. The technologies used in the billing and handling of customers. Upon completion of this course the attendees will have a clear understanding of the design and engineering principles used in Smart Metering. This course will increase understanding of energy utilization and energy efficiency.

## The Program

### **kWh AND kVArh METERS**

- kWh meters
- After Diversity Maximum Demand (ADMD)
- Principle of operation of various kWh meters
- kVArh meters
- Various connections of kWh and kVArh meters
- Calculation of multiplier factor
- Apparent, active and reactive power calculation
- kWh and kVArh meters: Testing and calibration

### **INTRODUCTION TO SMART METERING**

- Energy Measurement
- Gas/Water/Heat Metering
- Conventional Meters
- Metering Approaches
- Need of Smart Metering
- Features of Smart Metering

### **BASICS OF SMART METERS**

- Definition of a Smart Meter
- Functions and Features of Smart Meters
- Block Diagram and Design of Smart Meters
- Introduction of Prepayment Meters
- Tampering and Security of Meters
- Introduction to M-bus(EN13757) and Wireless M-bus

### **METERING TECHNOLOGIES**

- Metering technologies for Smart Metering
- Technologies used for Communication
- Technologies for Data Storage
- Meter Data Management (MDM)
- Methods used for billing (Tariff Structure)
- Load Control Technology
- System Architecture and Implementation

### **ADVANCED METERING INFRASTRUCTURE (AMI)**

- Definition of AMI
- Advanced Meter Reading Solutions (AMR)
- Implementing AMI
- Benefits of AMI
- AMI communication Strategy
- Security Aspects for AMI
- AMR Vs AMI Capability

### **INTRODUCTION OF SMART GRID**

- Need for Smart Grid
- Characteristics of Smart Grid
- Future of Smart Grid
- Features and Implementation of Smart Grid
- Technologies for Smart Grids
- Smart Grid Milestones

### **APPLICATIONS OF SMART METERING**

- Implementation of Smart Metering for Water utilities
- Implementation of Smart Metering for Gas Utilities
- Study Reports of Smart Metering for Energy Savings
- Designing of Smart Homes using Smart Metering
- Designing of Smart Premises using Smart Metering
- AMR used in Submetering

### **IMPLEMENTATION OF SMART METERING IN DIFFERENT COUNTRIES**

- Smart Metered Countries
- Smart metering initiatives around the world
- Cost Benefit Analysis for AMI
- Case Study and Roll out of AMI trials for Australia

### **SUMMARY, OPEN FORUM AND CLOSING**

## Practical Sessions

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