



Training Program:

Electrical Demand-Side Management (DSM)

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Introduction:

Demand Side Management involves steps taken by the customer on their meter to change and regulate the amount or timing of energy consumption. Power supply utilities offer a variety of measures that can reduce energy consumption and consumer energy expenses. Electricity DSM strategies have the goal of maximizing end-use efficiency to avoid or postpone the construction of new generating plants. There are various opportunities and techniques available for reducing energy consumption.

These include efficient lighting, variable speed drives, solar hot water systems etc. These technologies reduce demand, help in lowering high peak prices and also reduce greenhouse gas emissions due to less stress on generating plants. Load Response Programs also play effective role in DSM. These include switching off or reschedule of nonessential and non-critical loads by the end users in response to the request of the utilities. This can lead to save the system network from exceeding its peak rating.

Demand-side management (DSM) has been traditionally seen as a means of reducing peak electricity demand so that utilities can delay building further capacity. In fact, by reducing the overall load on an electricity network, DSM has various beneficial effects, including mitigating electrical system emergencies, reducing the number of blackouts and increasing system reliability. Possible benefits can also include reducing dependency on expensive imports of fuel, reducing energy prices, and reducing harmful emissions to the environment.

Finally, DSM has a major role to play in deferring high investments in generation, transmission and distribution networks. Thus DSM applied to electricity systems provides significant economic, reliability and environmental benefits. The motivation behind the implementation of DSM is obviously different for the various parties involved. Thus for utility companies, the reduction or shift of a customer's energy demand could mean avoiding or delaying building additional generating capacity. In some situations, this would avoid or defer energy price increases that would otherwise be imposed on customers to help finance new investments in system capacity. For customers, DSM offers the opportunity to reduce their energy bill through efficiency and conservation measures. In the case of industrial customers, this would translate to lower production costs and a more competitive product. For domestic customers it means that they would save money that could be spent on other household commodities.

This 5 seminar covers "Electrical demand-side management" or EDSM, as applied to energy efficiency measures that modify or reduce end-users' energy demand. This has traditionally been applied to electricity loads but is also used for changes that can be made to demands for all types of energy. The benefits for the energy user are reduced energy costs for a given output (production level or other measure of activity). For the energy provider, the benefit is a better use of its supply capacity.

Who Should Attend?

Electrical power engineers and advanced operating staff of substations, factories, electrical distribution networks and transmission.

Methodology

This interactive Training will be highly interactive, with opportunities to advance your opinions and ideas and will include;

- Lectures
- Workshop & Work Presentation
- Case Studies and Practical Exercise
- Videos and General Discussions

Accreditation:

BTS attendance certificate will be issued to all attendees completing a minimum of 80% of the total course duration.

Objective:

The aims of the seminar are to achieve the following learning outcomes:

- To introduce the concept of demand-side management for residential, commercial and industrial energy users.
- To give an overview of the different types of demand-side measures.
- To show how housekeeping and preventative maintenance in commerce and industry can be used to reduce energy demand.
- To describe energy auditing and routine data collection and monitoring, and to indicate their benefits.

- To outline information dissemination on demand-side management.
- To provide an overview of the major implementation challenges for DSM programmes.

Course Outline

Introduction to DSM

- What is DSM?
- Objectives of DSM
- Why promote DSM?
- What drives DSM?
 - Cost reduction and environmental motives
 - Reliability and network motives
- **Types of DSM measures**
 - Energy reduction programmes
 - Load management programmes
 - Load growth and conservation programmes
- Information Dissemination on DSM
- Challenges of implementing DSM programmes

Electric Energy Management

- Introduction
- Power Supply

- Effects of Unbalanced Voltages on the Performance of Motors Effect of Performance-General
- Motor Sizing
- Power Factor
- Handy Electrical Formulas & Rules of Thumb
- Electric motor Operating Loads
- Determining Electric Motor Operating Loads
- Power Meter
- Slip Measurement
- Amperage Readings
- Electric Motor Efficiency
- Comparing Motors
- Variable Speed drive
- Sensitivity of Load to Motor RPM
- Theoretical Power Consumption
- Motor Efficiency Management
- Motors Are Like People
- Motor Performance Management Process (MPMP)
- How to Start MPMP
- Nameplate Glossary

Energy Management Control Systems

- Energy Management Systems
- Justification of EMCSS
- Systems Integration

Lighting

- Introduction
- Lighting Fundamentals
- Process to Improve Lighting Efficiency
- Maintenance
- New Technologies & Products
- Special Considerations
- Day-lighting
- Common Retrofits
- Schematics
- Artificial Lighting Design

Energy efficiency in buildings

- Energy efficiency in buildings methodology
- Energy efficiency measures for buildings
- Financing energy efficiency for buildings
- Developing and implementing policy on energy efficiency in buildings

- Policy tools to promote building efficiency

Use of Alternative Energy

- Introduction
- Distributed Generation
- Solar Energy
- Wind Energy
- Refuse-Derived Fuel
- Fuel Cells