



Electrical Engineering

SCADA EMS for Power System Dispatch Center

Course Introduction

The Energy Management System

The Energy Management System or EMS as we know it today had its origin in the need for electric utility companies to operate their generators as economically as possible. That there was ample cost justification for this has been demonstrated many times. At this point, I shall refer to an electric power system as consisting of generators, transmission system, and the distribution system to customer loads.

To operate the system as economically as possible it required that the characteristics of all generating units be available in one location so that the most efficient units could be dispatched properly along with the less efficient. In addition, there was a requirement that the on/off scheduling of generating units be done in an efficient manner as well. Finally, the scheduling of generators with limited fuel or water supplies were incorporated in energy management systems.

This allows operators to further reduce the cost of operation by taking advantage of cheaper fuels or hydro power. When operating within a vertically integrated electric utility - i.e., one which owns and operates the generation, transmission, and the distribution the economic dispatch and scheduling of generation is usually done to minimize the total operating cost of generation. When the electric system is unbundled, the economic dispatch and scheduling is done on the basis of prices bid to a central office.

Target Audience

- Power-distribution engineer
- Controls design engineer

Learning Objectives

- This course includes the desire to mention briefly & study the final recommendations for energy saving in Generation, Transmission, Distribution, & Utilization.
- Also, provide the participants with Global Perspective and insight on Energy Consulting abroad.

Course Outline

- **DAY 01**

- Module (01) Introduction to SCADA for Power System**

- 1.1 SCADA Definitions
 - 1.2 Overview of SCADA System
 - 1.3 Major SCADA Suppliers
 - 1.4 Software Tools
 - 1.5 SCADA System Engineering

- Module (02) SCADA Application in Power System**

- 2.1 Overview
 - 2.2 Electrical Substation
 - 2.3 Power Stations
 - 2.4 Evolution of System monitoring & Contro
 - I 2.5 Substation Automation System

- **Day 02**

- Module (03) SCADA Security Controls**

- 3.1 Securing the System
- 3.2 Security Policy
- 3.3 New Technology for SCADA
- 3.4 SCADA Interfacing with other System
- 3.5 SCADA to Corporate System

Module (04) Evolution and Functions of Energy Management Systems

- 4.1 Course Overview Introduction
- 4.2 Role, Architecture and Application of EMS in the Fully Integrated Power Utility
- 4.3 The EMS under Deregulation and /or Restriction. The independent system Operator
- 4.4 Communication and data interfaces for Modern EMS 4
- .5 Introduction to Market Administration in Destructed Environment

• Day 03

Module (05) Fundamental Power System Applications in the EMS

- 5.1 State Estimation and Application
- 5.2 Short Term Load Forecasting and Application
- 5.3 Reliable Operation of the Power System
- 5.4 On-Line Voltage and Dynamic Stability Assessment
- 5.5 Optimal Power Flow

• Day 04

Module (06) EMS Applications and Restructuring

- 6.1 Unit Commitment Scheduling
- 6.2 Automatic Generation Control
- 6.3 Review of Market Designs and ISO's in Selected Regions
- 6.4 Markets Based on Locational Marginal Pricing
- 6.5 Congestion Management.

Module (07) EMS Applications and Restructuring

- 7.1 Ancillary Services and Settlements
 - 7.2 Open Access Requirements and Applications
 - 7.3 Automatic Generation Control Performance
 - 7.4 Introduction to Risk Management in Electricity Markets
 - 7.5 Options and Futures in Electricity Market Trading
- Day 05

Module (08) Toward a New EMS Philosophy in the Middle East

- 8.1 Forward Market Administration 8.2 Competitive Bidding in Generation Market
- 8.3 Dealing with Uncertainty and Risk in Day Ahead Markets
- 8.4 Applications to the Middle East GCC Interconnection
- 8.5 Final Discussion and Review

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
June 23, 2025	June 27, 2025	5 days	4250.00 \$	UAE - Dubai
Sept. 22, 2025	Sept. 26, 2025	5 days	4250.00 \$	UAE - Dubai
Dec. 22, 2025	Dec. 26, 2025	5 days	4250.00 \$	UAE - Dubai
Oct. 12, 2025	Oct. 16, 2025	5 days	4250.00 \$	oman - salalah