

Contents

Chapter 1 — Introduction

- Power Sector Reforms
- Objectives of the Book
- Generation, Transmission and Distribution
- T&D System Mission
- Basic Distribution Systems
- Distribution System Reliability

Chapter 2 — Distribution System Planning

- Introduction
- Short-Term Load Forecasting
- Long-Term Energy Forecasting
- Distribution of Power
- Distributed Energy Supply Systems
- Technological Forecasting

Le chapitre explique notamment pourquoi la prévision de charge est fondamentale pour déterminer **la localisation, la capacité et le calendrier des futures installations**.

Chapter 3 — Distribution Automation

- Problems with Existing Distribution Systems
- Need for Distribution Automation
- Characteristics of Distribution Systems
- Objectives of Distribution Automation
- Functions of Distribution Automation
- Benefits of Distribution Automation
- Communication Requirements
- Remote Terminal Unit (RTU)
- Sectionalizing Switches

L'automatisation vise notamment à améliorer la fiabilité, réduire les pertes et diminuer la durée des interruptions.

Chapter 4 — SCADA System

- Introduction to SCADA
- SCADA Block Diagram
- Components of SCADA
- SCADA Functions
- SCADA Applied to Distribution Automation

- Advantages of SCADA
- Requirements and Feasibility
- DA Integration Mechanisms
- Communication Protocols

Chapter 5 — Substation Automation

- Introduction
- Substation Automation
- Functions of Substation Automation Systems
- Monitoring and Control
- Protection and Automation
- Intelligent Substation Concepts

Chapter 6 — Feeder Automation

- Feeder Automation
- Feeder Monitoring
- Automatic Switching
- Fault Detection
- Fault Isolation
- Service Restoration
- Voltage/VAR Control

Chapter 7 — Faults in Distribution Feeders

- Distribution Feeder Faults
- Fault Detection
- Fault Location
- Fault Isolation
- System Restoration
- Reliability Improvement

Chapter 8 — Remote Metering

- Automatic Meter Reading (AMR)
- Components of AMR Systems
- Communication Methods
- AMR Services and Functions
- Implementation of Remote Metering
- Financial Analysis

Les systèmes AMR permettent notamment la relève automatique des compteurs et l'échange d'informations entre les compteurs et le système de supervision.

Chapter 9 — Energy Auditing

- Energy Audit
- Energy Consumption
- Distribution Losses
- Technical Losses
- Non-Technical Losses
- Loss Reduction

Chapter 10 — Energy Management

- Energy Management
- Need-Based Energy Management (NBEM)
- Demand Side Management (DSM)
- Load Management
- Energy Conservation

Chapter 11 — Economics of Power Distribution

- Economic Analysis
- Distribution Automation Economics
- Investment Analysis
- Cost–Benefit Analysis
- Economic Justification

Chapter 12 — Artificial Intelligence Techniques Applied to Distribution Automation

- Artificial Intelligence
- Expert Systems
- Intelligent Decision Making
- AI-Based Distribution Automation
- Fault Diagnosis
- Optimization Techniques

Chapter 13 — Urban and Rural Distribution Systems

- Urban Distribution Systems
- Rural Distribution Systems
- Characteristics of Urban Networks
- Characteristics of Rural Networks
- Reliability and Planning Considerations

Chapter 14 — Optimal Switching Device Placement in Radial Distribution Systems

- Radial Distribution Systems

- Switching Devices
- Optimal Switch Placement
- Network Reconfiguration
- Loss Reduction
- Reliability Improvement
- Optimization Algorithms

Chapter 15 — Communication Technology

- Communication Requirements
- Communication Networks
- Communication Technologies
- Data Transmission
- Communication Protocols
- Communication for Distribution Automation