



Process Plant Optimization & Energy Conservation Course

6 – 10 December 2026
Manama (Bahrain)





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Introduction

Plant integrity and reliability are the cornerstone of process plant optimization. For optimization benefits to be sustainable, production interruptions must be kept to a minimum, which requires effective management of degradation processes that affect equipment and systems and practical inspection and maintenance strategies, plans, and methods. Plant optimization can be an effective way to achieve improved profitability without the significant investment associated with building a new plant.

Standard industrial processes and systems, such as steam, cooling water, process heating, and electric motors, consume most of the energy and offer significant opportunities for savings. Process changes such as advanced controls, new catalysts, and new technologies also present opportunities for plant optimization.

This plant optimization and energy conservation strategy course will provide a comprehensive review of the various aspects of process plant optimization as an essential foundation for sustainable plant profitability and optimization.

Additional Considerations in Energy Conservation and Plant Optimization

In this plant optimization and energy conservation strategy course, we delve deeper into the advantages of energy conservation, highlighting the benefits of conserving energy, such as cost savings, reduced environmental impact, and enhanced system reliability.

We will explore energy conservation techniques and consider the importance of energy conservation in contemporary industry, establishing a robust energy conservation strategy that aligns with organizational objectives. Through detailed energy conservation training, participants will be equipped with the necessary skills to obtain energy conservation certification and implement an effective energy conservation program.

Participants in the plant optimization and energy conservation strategy course will walk away with a comprehensive understanding of energy conservation and management, which are vital components in achieving optimal plant efficiency.

As the global landscape shifts towards more sustainable practices, the knowledge and skills imparted in this plant optimization and energy conservation strategy course will be indispensable for both personal advancement and for driving organizational success in energy conservation management.

Targeted Groups

- Process Plant Supervisors.
- Plant Engineers and Operators.
- Production and Operation Engineers.
- Maintenance Engineers and Technicians.
- Engineering and technical personnel are involved in improving process plants, petrochemical plants, refinery profitability, and energy efficiency.

Course Objectives

By the end of this plant optimization and energy conservation strategy course, the participants will be able to:

- Understand what plant optimization and energy conservation are all about - the drivers, the potential benefits, and the strategies to realize them.
- Enhance the business focus and make more contributions to sustainable plant profitability.
- Learn how to identify the most attractive opportunities for energy savings.
- Gain managerial tools to optimize plant operations effectively.
- Learn practical and effective methods and tools to perform technical and economic evaluations of the alternatives.
- Understand the elements of plant optimization.
- Maximize the plant availability, reliability, and productivity.
- Minimize the operational costs.

Targeted Competencies

By the end of this plant optimization and energy conservation strategy course, the target competencies will be able to:

- Process Overall Plant Effectiveness OPE.
- Understand best practices in operation and maintenance.
- Learn about business sustainability and related factors.
- Energy conservation opportunities.
- Strategies for improving plant profitability.

Course Content

Unit 1: Process Plant Operation, Integrity, and Reliability

- Overview process plant optimization and energy conservation.
- Understand Asset Integrity Management AIM and optimization - integrating operation, inspection, and maintenance efforts.
- Plant integrity and reliability - the cornerstone of plant optimization and energy management.
- Learn about how operation and maintenance impact plant integrity and reliability.
- Equipment condition monitoring and assessment.
- Establishment of Operating Windows OW - Maximize throughput within limits defined by mechanical-structural integrity over the expected life of the asset components.
- Learn about the effective Management of Change MOC program - The ongoing link between engineering, operations, and maintenance.
- Process plant economics.

Unit 2: Process Plant Optimization

- Process control basics.
- Elements of process plant optimization.
- Learn about components required to optimize an industrial process.
- Understand process or a mathematical model of the process and process variables that can be manipulated and controlled.
- The basics of heat integration.
- Pinch technology.
- Heat exchanger train optimization.
- Optimization procedure.
- Apply simulation technology to plant optimization and control-plant optimization models.

Unit 3: Industrial Energy Management - Energy Efficiency: Good for Business - Good for the Environment

- Energy use and optimization in process industries.
- Industrial energy management techniques.
- What are industrial energy management and system standards?
- Industry program for energy conservation.
- Understand best practices in process plant energy management.
- Develop a customized energy management program.
- Understand the obstacles that face the energy management program.
- Learn about examples of energy management programs and standards, such as CIPEC and UNIDO.
- Learn incentives for energy assessment and energy retrofit projects.

Unit 4: Energy Conservation Opportunities

- Implement an energy management program.
- Benchmarking energy intensity and usage.
- Learn about technology options in new energy-efficient technologies. Examples include a corrosion analyzer for advanced materials and fabricated components and a fiber optic sensor for combustion measurement and control.
- Energy conservation checklist.
- Plant processes.
- Mechanical systems.
- Electric power.
- Understand technical and economic evaluation of potential opportunities.

Unit 5: The Implications of Plant Optimization Activities

- Relate energy efficiency To business outcomes.
- Impact of optimization activities and technological modifications to the plant.
- Plant integrity and safety.
- Technology licenses.
- Financing agreements.
- Impact on human resources in the human factor.