

Course No. 1570

Energy Management for Oil & Gas Facilities Training Course

**ENERGY MANAGEMENT & SUSTAINABILITY
INDUSTRIAL ENGINEERING, MAINTENANCE & OPERATIONS**

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The Energy Management for Oil & Gas Facilities Training Course provides an advanced and practical framework for improving energy efficiency, reducing energy consumption and operating costs, and strengthening energy performance across oil and gas facilities while maintaining production, safety, reliability, and operational continuity. The course focuses on developing an integrated energy management approach that begins with measuring and analyzing energy consumption and extends to process optimization, equipment efficiency, utility management, performance monitoring, and continuous improvement.

Oil and gas facilities have complex and energy-intensive operations due to their reliance on furnaces, boilers, gas and steam turbines, compressors, pumps, heat exchangers, separation and processing systems, cooling systems, steam networks, and compression facilities. Effective energy management therefore requires a clear understanding of how process conditions, equipment performance, operating practices, maintenance, and energy flows interact. The course provides a structured approach to identifying major energy drivers, losses, inefficiencies, and improvement opportunities.

The program covers energy and heat balances, fuel and electricity consumption analysis, combustion efficiency, furnace and boiler performance, turbine efficiency, compressor and pump optimization, heat exchanger performance, steam and condensate systems, cooling systems, compressed air, and waste heat recovery. Participants will also examine process integration and operating optimization techniques that can reduce energy consumption while maintaining production rates, product quality, equipment reliability, and safety requirements.

The course also focuses on facility-level energy management, including energy baselines, energy performance indicators, benchmarking, performance deviation analysis, energy efficiency project evaluation, and technical and economic prioritization. It emphasizes the integration of energy management with maintenance, asset management, engineering, operations, and sustainability so that energy efficiency becomes part of daily performance management rather than a series of isolated initiatives.

Through oil and gas case studies, energy balance exercises, equipment performance assessments, process optimization activities, waste heat recovery analysis, and improvement planning workshops, the Energy Management for Oil & Gas Facilities Training Course develops practical capabilities that

can be applied across upstream, midstream, downstream, processing, compression, refining, and petrochemical environments. The course is suitable for energy managers, engineers, operations leaders, maintenance professionals, sustainability specialists, and senior decision makers.

Objectives

- Analyze the principles of energy management and their role in improving operational and financial performance in oil and gas facilities during the course.
- Develop energy and heat balances for process facilities to identify energy inputs, useful outputs, and major losses.
- Evaluate fuel and electricity consumption and identify the principal energy drivers across oil and gas operations.
- Apply practical techniques to improve the efficiency of furnaces, boilers, turbines, compressors, pumps, and heat exchangers.
- Assess steam, cooling, compressed air, and utility systems and identify opportunities for improved performance.
- Design operating strategies that reduce energy consumption without compromising production, safety, reliability, or product quality.
- Evaluate waste heat recovery and process heat integration opportunities across facility systems.
- Apply energy performance indicators, baselines, and benchmarking methods to monitor and improve energy performance.
- Analyze the technical and economic feasibility of energy efficiency projects and prioritize initiatives according to value and risk.
- Develop mechanisms for integrating energy management with maintenance, asset management, engineering, and operations.
- Strengthen monitoring, verification, and executive reporting of energy efficiency improvement initiatives.
- Align energy management practices in oil and gas facilities with cost reduction, sustainability, reliability, and long-term organizational objectives.

Who Should Attend

This course is designed for professionals working in energy management, engineering, operations, maintenance, mechanical engineering, process engineering, utilities, reliability, and sustainability within the oil and gas sector. It is particularly relevant to Energy Managers, Energy Engineers, Process Engineers, Mechanical Engineers, Utilities Managers, Operations Managers, Maintenance Managers, Reliability Engineers, Energy Efficiency Specialists, Energy Analysts, and professionals responsible for monitoring and improving facility energy performance.

The program is also suitable for Engineering Managers, Facility Managers, Operations Directors, Maintenance Directors, Asset Managers, Sustainability Managers, Technical Managers, and senior decision makers responsible for energy consumption, operating costs, equipment performance, and capital improvement programs. Professionals working in upstream, midstream, downstream, refining, petrochemical, gas processing, compression, and other energy-intensive operations can benefit from the frameworks covered in the course.

The course is particularly valuable for professionals involved in energy audits, process optimization, furnace and boiler operations, compressors, turbines, pumps, steam systems, cooling systems, waste heat recovery, facility utilities, energy monitoring, and energy efficiency projects. It also provides value for finance, procurement, project management, and sustainability professionals involved in evaluating and supporting energy improvement investments.

Learning Outcomes

- Explain the principles of energy management and their application within oil and gas facilities.
- Prepare and interpret energy and heat balances for process units and facilities.
- Analyze fuel and electricity consumption patterns and identify major energy drivers.
- Evaluate the performance of furnaces, boilers, turbines, compressors, pumps, and heat exchangers.
- Identify thermal, electrical, mechanical, and utility energy losses and develop appropriate corrective actions.
- Apply process and operating optimization techniques to improve energy efficiency.
- Evaluate opportunities for waste heat recovery and energy integration across facility systems.
- Apply energy baselines, performance indicators, and benchmarking techniques to monitor energy performance.

- Assess the technical and economic feasibility of energy efficiency projects and prioritize improvement initiatives.
- Integrate energy management with maintenance, asset management, reliability, and operational practices.
- Prepare executive-level reports covering energy performance, savings opportunities, risks, and recommended actions.
- Develop an integrated energy management plan for an oil and gas facility that supports efficiency, sustainability, reliability, and operational performance.

Course Outline

DAY 01

Energy Management Foundations and Energy Performance Assessment in Oil & Gas Facilities

- Energy management principles and objectives in oil and gas facilities
- Energy consumption characteristics across exploration, production, processing, and refining
- Major energy sources: fuel, gas, electricity, and steam
- Energy and heat balances and system boundaries
- Identification of significant energy users
- Energy baselines and consumption trend analysis
- Energy measurement, instrumentation, data collection, and data quality
- Energy performance indicators and benchmarking

PRACTICAL APPLICATION

Develop an energy balance for a representative oil and gas facility and identify major energy-consuming systems, losses, and improvement opportunities

DAY 02

Process Optimization and Thermal and Rotating Equipment Efficiency

- Process operating optimization and energy-efficient operating conditions
- Furnace and process heater efficiency

DAY 02 — CONTINUED

- Boiler efficiency and combustion optimization
- Gas and steam turbine efficiency
- Compressor performance and energy optimization
- Pump efficiency and flow optimization
- Heat exchanger performance and the impact of fouling and pressure drop
- Relationship between equipment condition and energy consumption

PRACTICAL APPLICATION

Assess the performance of selected process equipment and develop actions to improve energy efficiency and reliability

DAY 03

Steam, Cooling Systems and Energy Recovery

- Steam generation, distribution, and utilization in oil and gas facilities
- Steam pressure management, steam traps, and condensate recovery
- Improving steam network efficiency
- Cooling systems and chilled-water or cooling-water energy performance
- Compressed air systems and energy consumption
- Identification of waste heat sources within oil and gas processes
- Waste heat recovery from flue gases, exhaust streams, and process streams
- Heat integration between process units

PRACTICAL APPLICATION

Analyze a steam, cooling, and waste heat recovery system and identify opportunities to improve performance and recover useful energy

DAY 04

Energy Monitoring, Maintenance and Economic Optimization

- Energy monitoring systems and energy consumption data management
- Development and use of energy performance indicators and operating baselines

DAY 04 — CONTINUED

- Analysis of energy consumption deviations
- Detection of efficiency deterioration and abnormal operating conditions
- Preventive and predictive maintenance and their relationship with energy efficiency
- Evaluation of equipment replacement and control system improvement opportunities
- Technical and economic evaluation of energy efficiency projects
- Estimating savings potential, payback considerations, and operational impacts
- Prioritizing initiatives according to savings, risk, investment, and feasibility

PRACTICAL APPLICATION

Develop a prioritized energy improvement project portfolio for an oil and gas facility and evaluate the technical and economic case for implementation

DAY 05

Energy Management Strategy, Governance and Continuous Improvement

- Developing an integrated energy management strategy for oil and gas facilities
- Integrating energy management with operations, maintenance, asset management, and engineering
- Developing energy objectives, targets, and performance indicators
- Monitoring and verifying the results of energy efficiency initiatives
- Executive and management reporting on energy performance
- Governance of energy management programs and accountability structures
- Change management and strengthening operational energy discipline
- Linking energy efficiency with sustainability, cost reduction, and operational resilience
- Continuous improvement and periodic energy performance reviews

FINAL WORKSHOP

Develop and present an integrated Energy Management for Oil & Gas Facilities strategy covering energy balances, energy drivers, equipment efficiency, process optimization, steam and cooling systems, waste heat recovery, monitoring, economic evaluation, governance, performance indicators, and implementation priorities



Register or Request More Information

Course page: <https://quest-training.com/courses/energy-management-for-oil-gas-facilities-training-course>

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