Mechanical Engineering

Sustainable Solutions and Best Practice Digital Technologies for Production Boosting: Focus on Pumps and Compressors

Course Introduction

Training Methodology:

- Classroom lectures and discussions
- Interactive workshops and case studies
- Hands-on exercises using simulation software
- Site visits to O&G MARKET LEADER facilities (optional)
- Group projects and presentations

Target Audience

Senior and Team Lead Engineers, New Technologies Engineers

Learning Objectives

- Understand the latest sustainable solutions and digital technologies for boosting production with pumps and compressors.
- Apply best practice engineering design and selection principles for optimal pump and compressor performance.
- Utilize advanced performance analysis techniques to troubleshoot, optimize, and maintain pumping and compression systems.
- Evaluate the economic and environmental impacts of different production boosting technologies.
- Develop and implement sustainable solutions for maximizing production while minimizing environmental footprint.

Course Outline

- **01 DAY ONE**

  Module 1: Introduction to Production Boosting

  - Overview of artificial lift methods and their applications
  - Fundamentals of pump and compressor operation
  - Key performance indicators (KPIs) for production boosting
  - Sustainability considerations in oil and gas production

- **02 DAY TWO**

  Module 2: Sustainable Solutions for Pump Systems

  - Energy-efficient pump technologies (e.g., ESPs, PCPs, multiphase pumps)
  - Optimizing pump design and operation for reduced energy consumption
  - Life cycle assessment (LCA) of pump systems
  - Case studies of sustainable pump applications in O&G MARKET LEADER projects

- **03 DAY THREE**

  Module 3: Sustainable Solutions for Compressor Systems

  - Energy-efficient compressor technologies (e.g., centrifugal, reciprocating)
  - Optimizing compressor design and operation for reduced emissions
  - Waste heat recovery and utilization in compressor systems
  - Case studies of sustainable compressor applications in O&G MARKET LEADER projects

- **04 DAY FOUR**

  Module 4: Digital Technologies for Pump and Compressor Optimization

  - Introduction to Industrial Internet of Things (IIoT) and its applications in production boosting
  - Real-time monitoring and data acquisition systems for pumps and compressors
  - Advanced analytics and machine learning for performance optimization
  - Predictive maintenance and failure prevention strategies

- **05 DAY FIVE**

Module 5: Engineering Design of Pumping Systems

- Pump selection criteria and best practices
- Hydraulic analysis and system design considerations
- Material selection for corrosion and wear resistance
- Case studies of pump design optimization in O&G MARKET LEADER projects

- **06 DAY SIX**

Module 6: Engineering Design of Compressor Systems

- Compressor selection criteria and best practices
- Thermodynamic analysis and system design considerations
- Material selection for high-pressure and high-temperature applications
- Case studies of compressor design optimization in O&G MARKET LEADER projects

- **07 DAY SEVEN**

Module 7: Pump Performance Analysis and Troubleshooting

- Performance testing and data interpretation
- Diagnosing common pump problems (e.g., cavitation, vibration, wear)
- Troubleshooting techniques and best practices
- Case studies of pump performance optimization in O&G MARKET LEADER projects

- **08 DAY EIGHT**

Module 8: Compressor Performance Analysis and Troubleshooting

- Performance testing and data interpretation
- Diagnosing common compressor problems (e.g., surge, fouling, lubrication issues)
- Troubleshooting techniques and best practices
- Case studies of compressor performance optimization in O&G MARKET LEADER projects

- **09 DAY NINE**

Module 9: Advanced Pump Technologies

- Emerging pump technologies (e.g., smart pumps, downhole separation)
- Applications of artificial intelligence (AI) in pump optimization
- Future trends in pump technology and sustainability
- Research and development initiatives in O&G MARKET LEADER

- **10 DAY TEN**

Module 10: Advanced Compressor Technologies

- Emerging compressor technologies (e.g., magnetic bearing compressors, hydrogen compression)
- Applications of AI in compressor optimization
- Future trends in compressor technology and sustainability
- Research and development initiatives in O&G MARKET LEADER

- **11 DAY ELEVEN**

Module 11: Economic Evaluation of Production Boosting Technologies

- Life cycle cost analysis (LCCA) of pump and compressor systems

- **12 DAY TWELVE**

Module 12: Evaluating the economic benefits of sustainable solutions

- Investment decision-making and risk assessment
- Case studies of economic evaluation in O&G MARKET LEADER projects

- **13 DAY THIRTEEN**

Module 13: Environmental Impact Assessment of Production Boosting Technologies

- Environmental regulations and compliance requirements

- **14 DAY FOURTEEN**

Module 14: Assessing the environmental footprint of pump and compressor systems

- Assessing the environmental footprint of pump and compressor systems
- Mitigation strategies and best practices
- Case studies of environmental impact assessment in O&G MARKET LEADER projects

- **15 DAY FIFTEEN**

Module 15: Mitigation strategies and best practices

- Case studies of environmental impact assessment in O&G MARKET LEADER projects

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
May 3, 2025	May 21, 2025	15 days	16500.00 $	England - London