

AMERICAN GLOBAL INSTITUTE  
FOR PRIVATE TRAINING



## **External Training Course**

### **Pump Service Excellence: Verification, Validation & Operational Testing**

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**From 21 Apr. To 25 Apr. 2025**

**From 23 Jun. To 27 Jun. 2025**

**From 20 Oct. To 24 Oct. 2025**

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Tokyo, Japan**

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### **Pump Service Excellence: Verification, Validation & Operational Testing**

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## Course Overview

This specialized training course is designed to equip professionals in the oil and gas industry with advanced knowledge and practical skills in pump service, verification, validation, and operational testing. The course covers best practices for maintaining pump reliability, optimizing performance, and ensuring compliance with international standards such as API 610, ASME, ISO 9001, and IEC 61511. Participants will gain expertise in diagnostic testing, failure analysis, and predictive maintenance to enhance pump system efficiency and minimize downtime.

## Course Objectives

By the end of this course, participants will be able to:

- Implement best practices for pump service, testing, and validation in oil & gas operations.
- Apply verification and validation (V&V) methodologies to ensure pump compliance with industry standards.
- Conduct performance testing, failure analysis, and operational diagnostics for pumps.
- Develop preventive and predictive maintenance strategies to enhance pump longevity.
- Utilize advanced testing tools and monitoring technologies to optimize pump performance.
- Troubleshoot common pump failures and operational challenges using data-driven approaches.
- Improve energy efficiency and cost-effectiveness of pump systems.

## **Who Should Attend?**

This course is ideal for professionals responsible for the operation, maintenance, and reliability of pump systems, including:

- Pump Service Technicians & Engineers.
- Maintenance & Reliability Engineers.
- QA/QC & Inspection Engineers.
- Operations & Asset Integrity.
- Environmental Engineers.
- Verification & Validation Specialist.
- Process, Mechanical & Safety Engineers.
- Instrumentation & Control Specialists.
- Project Managers & Technical Supervisors.
- Regulatory & Safety Compliance & Quality Assurance Officers.

## **Course Modules & Topics**

### Day 1: Fundamentals of Pump Service, Verification & Validation (V&V)

- Understanding pump service excellence and its role in reliability management.
- Overview of pump types and applications in oil & gas operations.
- Differences between verification, validation, and operational testing.
- Industry standards and regulatory compliance (API 610, ISO 9001, ASME, IEC).
- Introduction to failure modes, reliability testing & risk assessment.

### Day 2: Verification & Compliance in Pump Systems

- Verification of pump design, materials, and specifications.
- Factory Acceptance Testing (FAT) & Site Acceptance Testing (SAT) for pumps.
- Inspection & quality control: Non-Destructive Testing (NDT) methods.
- Ensuring hydraulic performance, efficiency & pressure integrity.
- Case Study: Verification challenges in offshore and refinery pump systems.

## Day 3: Validation of Pump Performance & Mechanical Integrity

- Validation of pump flow, pressure, and efficiency under real-world conditions.
- Reliability testing & operational performance validation.
- Detecting & mitigating cavitation, vibration, and overheating issues.
- Pump system calibration & control adjustments for optimal performance.
- Real-world case study: Validating pump performance in critical oil & gas operations.

## Day 4: Operational Testing & Predictive Maintenance Strategies

- Advanced performance testing methodologies for pumps.
- Condition-based monitoring: Vibration analysis, thermal imaging & acoustic emissions.
- Predictive diagnostics: AI-based monitoring & data-driven analytics.
- Troubleshooting techniques for common pump system failures.
- Case Study: Optimizing pump maintenance and reducing unplanned shutdowns.

## Day 5: Risk Mitigation & Pump Service Optimization

- Risk-based maintenance planning for pump systems.
- Implementing Failure Mode & Effects Analysis (FMEA) for pumps.
- Energy efficiency optimization & cost-saving techniques.
- Best practices for sustainable pump operation and service excellence.
- Final assessment & certification of completion.

## **Training Methodology**

Engaging presentations featuring real-world case studies.

Hands-on practical exercises in pump service, testing & validation.

Workshops & group problem-solving sessions.

Live demonstrations of advanced diagnostic tools.

Comprehensive training materials & reference guides.

Final assessment & recognized certification.

## **Why Attend This Course?**

Gain hands-on expertise in pump service, testing, and reliability.

Ensure compliance with global quality & safety standards.

Enhance pump system efficiency through advanced testing methods.

Reduce downtime & maintenance costs with predictive diagnostics.

Earn a recognized certification to advance your career in the oil & gas sector.

## Program Agenda:

### (1<sup>st</sup> Day) Agenda

8.30	9.00	Opening Remarks (30 Min.).
9.00	11.30	<u>DISCUSS COURSE OBJECTIVES:</u> <ul style="list-style-type: none"> <li>• Fundamentals of Pump Service, Verification &amp; Validation (V&amp;V).</li> <li>• Verification &amp; Compliance in Pump Systems.</li> <li>• Validation of Pump Performance &amp; Mechanical Integrity.</li> <li>• Operational Testing &amp; Predictive Maintenance Strategies.</li> <li>• Risk Mitigation &amp; Pump Service Optimization.</li> </ul>
11.30	12.00	Coffee Break
12.00	14.00	<u>Fundamentals of Pump Service, Verification &amp; Validation (V&amp;V):</u> <ul style="list-style-type: none"> <li>• Understanding pump service excellence and its role in reliability management.</li> <li>• Overview of pump types and applications in oil &amp; gas operations.</li> <li>• Differences between verification, validation, and operational testing.</li> <li>• Industry standards and regulatory compliance (API 610, ISO 9001, ASME, IEC).</li> <li>• Introduction to failure modes, reliability testing &amp; risk assessment.</li> </ul>
14.00	14.30	Questions and Discussion
14.30		Buffet Lunch

### (2<sup>nd</sup> Day) Agenda

9.00	11.30	<u>Verification &amp; Compliance in Pump Systems:</u> <ul style="list-style-type: none"> <li>• Verification of pump design, materials, and specifications.</li> <li>• Factory Acceptance Testing (FAT) &amp; Site Acceptance Testing (SAT) for pumps.</li> <li>• Inspection &amp; quality control: Non-Destructive Testing (NDT) methods.</li> </ul>
11.30	12.00	Coffee Break
12.00	14.00	<u>Verification &amp; Compliance in Pump Systems:</u> <ul style="list-style-type: none"> <li>• Ensuring hydraulic performance, efficiency &amp; pressure integrity.</li> <li>• Case Study: Verification challenges in offshore and refinery pump systems.</li> </ul>
14.00	14.30	Questions and Discussion
14.30		Buffet Lunch

## (3<sup>rd</sup> Day) Agenda

9.00	11.30	<u>Validation of Pump Performance &amp; Mechanical Integrity:</u> <ul style="list-style-type: none"> <li>Validation of pump flow, pressure, and efficiency under real-world conditions.</li> <li>Reliability testing &amp; operational performance validation.</li> <li>Detecting &amp; mitigating cavitation, vibration, and overheating issues.</li> </ul>
11.30	12.00	Coffee Break
12.00	14.00	<u>Validation of Pump Performance &amp; Mechanical Integrity:</u> <ul style="list-style-type: none"> <li>Pump system calibration &amp; control adjustments for optimal performance.</li> <li>Real-world case study: Validating pump performance in critical oil &amp; gas operations.</li> </ul>
14.00	14.30	Questions and Discussion
14.30		Buffet Lunch

## (4<sup>th</sup> Day) Agenda

9.00	11.30	<u>Operational Testing &amp; Predictive Maintenance Strategies:</u> <ul style="list-style-type: none"> <li>Advanced performance testing methodologies for pumps.</li> <li>Condition-based monitoring: Vibration analysis, thermal imaging &amp; acoustic emissions.</li> </ul>
11.30	12.00	Coffee Break
12.00	14.00	<u>Operational Testing &amp; Predictive Maintenance Strategies:</u> <ul style="list-style-type: none"> <li>Predictive diagnostics: AI-based monitoring &amp; data-driven analytics.</li> <li>Troubleshooting techniques for common pump system failures.</li> <li>Case Study: Optimizing pump maintenance and reducing unplanned shutdowns.</li> </ul>
14.00	14.30	Questions and Discussion
14.30		Buffet Lunch

## (5<sup>th</sup> Day) Agenda

9.00	11.30	<u>Risk Mitigation &amp; Pump Service Optimization:</u> <ul style="list-style-type: none"> <li>Risk-based maintenance planning for pump systems.</li> <li>Implementing Failure Mode &amp; Effects Analysis (FMEA) for pumps.</li> <li>Energy efficiency optimization &amp; cost-saving techniques.</li> </ul>
11.30	12.00	Coffee Break
12.00	14.00	<u>Risk Mitigation &amp; Pump Service Optimization:</u> <ul style="list-style-type: none"> <li>Best practices for sustainable pump operation and service excellence.</li> <li>Final assessment &amp; certification of completion.</li> </ul>
14.00	14.30	Questions and Discussion
14.30		Buffet Lunch