



External Training Course

Verification & Validation in Upstream Oil Operations: Integrating Safety, Compliance, and Environmental Risk Management

From 26 May To 30 May 2025

From 16 Jun. To 20 Jun. 2025

From 21 Jul. To 25 Jul. 2025

Hotel Monterey Ginza, Tokyo, Japan

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Fees: 2500 KD

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Course Introduction:

The upstream oil and gas sector faces complex operational challenges, requiring strict safety, compliance, and environmental risk management. Ensuring process integrity and regulatory adherence through Verification & Validation (V&V) methodologies is critical to maintaining safe, efficient, and environmentally responsible operations. This training course provides participants with in-depth knowledge of V&V principles, equipping them with the necessary skills to:

- Verify compliance with international safety and regulatory frameworks (API, ISO, OSHA, OGP).
- Validate critical equipment integrity, well control, and process safety.
- Implement risk assessment strategies to prevent failures and enhance operational reliability.
- Ensure adherence to environmental protection measures and sustainability goals.
- Utilize digital tools and AI-driven validation methods to improve efficiency.

The course combines real-world case studies, industry best practices, and hands-on exercises to help participants apply V&V techniques effectively in upstream oil operations.

Course Overview:

This course is structured to address the key Verification & Validation (V&V) processes in upstream oil operations, integrating safety, compliance, and environmental risk management. Key Focus Areas:

- Understanding V&V in Upstream Oil Operations – Differences between verification, validation, and inspection.
- Regulatory Compliance & International Standards – Ensuring adherence to global and regional oil & gas regulations.
- Process Safety & Risk Management – Verification of critical control measures for operational safety.
- Well Integrity & Equipment Validation – Ensuring proper functioning of pipelines, wellheads, BOPs, and production systems.
- Environmental Risk Management – Compliance with environmental regulations and sustainability verification.
- Human Factors & Digital Transformation – Using AI, remote monitoring, and predictive analytics for improved V&V.
- Incident Investigation & Continuous Improvement – Lessons learned from industry failures and best practices.

Course Objectives

Verification & Validation in Upstream Oil Operations: Integrating Safety, Compliance, and Environmental Risk Management. This training course aims to equip professionals in the upstream oil and gas sector with comprehensive knowledge and practical skills in Verification & Validation (V&V) processes. By the end of the course, participants will be able to:

Enhance Safety & Risk Management:

- Understand the role of Verification & Validation (V&V) in improving operational safety and reducing risks.
- Apply risk-based verification methodologies to identify and mitigate potential hazards.
- Conduct effective safety audits and compliance checks to ensure adherence to industry regulations.

Ensure Regulatory Compliance:

- Interpret and implement international regulatory frameworks (API, ISO, OSHA, OGP, IOGP).
- Conduct verification of compliance with regional and country-specific oil and gas safety regulations.
- Align V&V processes with Health, Safety, Security & Environment (HSSE) policies.

Improve Asset Integrity & Equipment Validation:

- Verify equipment performance, pipeline integrity, and well control measures.
- Ensure the proper functioning of critical safety barriers, such as blowout preventers (BOPs), emergency shutdown systems, and fire & gas detection systems.
- Utilize non-destructive testing (NDT) and real-time monitoring techniques for asset integrity assessment.

Strengthen Environmental Risk Management:

- Assess and validate environmental impact assessment (EIA) reports for upstream operations.
- Develop strategies for oil spill prevention, emissions control, and waste management compliance.
- Verify compliance with sustainability goals and corporate environmental responsibility.

Leverage Digital Tools & Technology in V&V:

- Integrate AI-driven predictive maintenance and digital verification technologies.
- Utilize remote monitoring, drones, and automated inspection systems for effective validation.
- Enhance data analytics and digital twin applications for proactive risk assessment.

Develop a Proactive Verification & Validation Culture:

- Improve incident investigation and root cause analysis skills for continuous improvement.
- Build a strong safety culture by integrating human factors in V&V strategies.
- Implement structured V&V protocols for operational excellence.

Who Should Attend?

This course is ideal for professionals involved in upstream oil and gas operations, including:

- HSE Professionals & Engineers.
- Safety Engineers, Safety compliance.
- Regulatory Compliance Officers.
- Operations & Maintenance Teams.
- Quality Assurance & Inspection Teams.
- Environmental Engineers & Risk Management Specialists.

Course Outline

Day 1: Introduction to V&V and Regulatory Frameworks

- Understanding Verification & Validation (V&V) in Upstream Oil Operations.
- Differences between Verification, Validation, and Inspection.
- Importance of V&V in Safety, Compliance, and Environmental Management.
- Key Regulatory Frameworks & Compliance Requirements.
- Case Study: Regulatory Non-Compliance & Its Consequences.

Day 2: Process Safety & Equipment Integrity Verification

- Process Safety Management (PSM) & V&V Best Practices.
- Risk Assessment Techniques (HAZOP, HAZID, Bowtie Analysis).
- Verification of Safety Critical Equipment & Systems.
- Asset Integrity Management (Pipelines, Wellheads, Valves, BOPs).
- Failure Modes & Root Cause Analysis (RCA).
- Workshop: Developing a Verification Checklist for Asset Integrity.

Day 3: Well Control & Environmental Risk Management

- Well Control & Blowout Prevention Validation.
- Drilling & Production Safety Verification.
- Managing Environmental Risks in Upstream Operations.
- Oil Spill Contingency Planning & Response Validation.
- Compliance with Environmental Impact Assessment (EIA) & Emission Control Standards.
- Case Study: Lessons from Major Environmental Incidents.

Day 4: Digital Transformation & Human Factors in V&V

- The Role of Digital Tools in Verification & Validation.
- Remote Monitoring & AI-driven Verification.
- Digital Twins & Predictive Analytics for Compliance Tracking.
- Human Factors & Safety Culture in V&V.
- Behavioral-Based Safety (BBS) & Workforce Engagement.
- Case Study: Digital Innovation in Upstream Safety Verification.

Day 5: Practical Implementation & Final Assessment

- Developing a V&V Strategy for Upstream Operations.
- Hands-on Workshop: Conducting a Compliance Audit.
- Emergency Preparedness & Incident Investigation.
- Final Knowledge Assessment & Group Presentations.

Program Agenda:

(1st 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"> • Introduction to V&V and Regulatory Frameworks. • Process Safety & Equipment Integrity Verification. • Well Control & Environmental Risk Management. • Digital Transformation & Human Factors in V&V. • Practical Implementation & Final Assessment.
11.30	12.00	Coffee Break
12.00	14.00	<u>Introduction to V&V and Regulatory Frameworks:</u> <ul style="list-style-type: none"> • Understanding Verification & Validation (V&V) in Upstream Oil Operations. • Differences between Verification, Validation, and Inspection. • Importance of V&V in Safety, Compliance, and Environmental Management. • Key Regulatory Frameworks & Compliance Requirements. • Case Study: Regulatory Non-Compliance & Its Consequences.
14.00	14.30	Questions and Discussion
14.30		Buffet Lunch

(2nd Day) Agenda

9.00	11.30	<u>Process Safety & Equipment Integrity Verification:</u> <ul style="list-style-type: none"> • Process Safety Management (PSM) & V&V Best Practices. • Risk Assessment Techniques (HAZOP, HAZID, Bowtie Analysis). • Verification of Safety Critical Equipment & Systems.
11.30	12.00	Coffee Break
12.00	14.00	<u>Process Safety & Equipment Integrity Verification:</u> <ul style="list-style-type: none"> • Asset Integrity Management (Pipelines, Wellheads, Valves, BOPs). • Failure Modes & Root Cause Analysis (RCA). • Workshop: Developing a Verification Checklist for Asset Integrity.
14.00	14.30	Questions and Discussion
14.30		Buffet Lunch

(3rd Day) Agenda

9.00	11.30	<u>Well Control & Environmental Risk Management:</u> <ul style="list-style-type: none"> Well Control & Blowout Prevention Validation. Drilling & Production Safety Verification. Managing Environmental Risks in Upstream Operations.
11.30	12.00	Coffee Break
12.00	14.00	<u>Well Control & Environmental Risk Management:</u> <ul style="list-style-type: none"> Oil Spill Contingency Planning & Response Validation. Compliance with Environmental Impact Assessment (EIA) & Emission Control Standards. Case Study: Lessons from Major Environmental Incidents.
14.00	14.30	Questions and Discussion
14.30		Buffet Lunch

(4th Day) Agenda

9.00	11.30	<u>Digital Transformation & Human Factors in V&V:</u> <ul style="list-style-type: none"> The Role of Digital Tools in Verification & Validation. Remote Monitoring & AI-driven Verification. Digital Twins & Predictive Analytics for Compliance Tracking.
11.30	12.00	Coffee Break
12.00	14.00	<u>Digital Transformation & Human Factors in V&V:</u> <ul style="list-style-type: none"> Human Factors & Safety Culture in V&V. Behavioral-Based Safety (BBS) & Workforce Engagement. Case Study: Digital Innovation in Upstream Safety Verification.
14.00	14.30	Questions and Discussion
14.30		Buffet Lunch

(5th Day) Agenda

9.00	11.30	<u>Practical Implementation & Final Assessment:</u> <ul style="list-style-type: none"> Developing a V&V Strategy for Upstream Operations. Hands-on Workshop: Conducting a Compliance Audit.
11.30	12.00	Coffee Break
12.00	14.00	<u>Practical Implementation & Final Assessment:</u> <ul style="list-style-type: none"> Emergency Preparedness & Incident Investigation. Final Knowledge Assessment & Group Presentations.
14.00	14.30	Questions and Discussion
14.30		Buffet Lunch