Training Course on Asset Integrity Management for Purpose-Built FPSO and Subsea System Facilities

Professional Development Training Course Outline

Category	Development	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

This intensive training course is meticulously designed to equip professionals with the critical knowledge and skills required for effective **Asset Integrity Management (AIM)** of purpose-built Floating Production Storage and Offloading (FPSO) vessels and complex **Subsea System Facilities** . The program emphasizes a holistic approach to maintaining the safety, reliability, and performance of these high-value assets throughout their operational lifecycle. Participants will gain a comprehensive understanding of degradation mechanisms, risk-based inspection (RBI) methodologies, proactive maintenance strategies, and the latest technologies for condition monitoring and integrity assurance. Strong keywords such as **FPSO integrity**, **subsea asset management**, **risk-based inspection**, **integrity assurance**, and **condition monitoring** are central to the course content, ensuring relevance and searchability for industry professionals seeking advanced training in this specialized domain.

The curriculum delves into the unique challenges associated with maintaining the integrity of aging FPSO assets and the complexities of subsea infrastructure, including umbilicals, risers, and flowlines (SURF). Through detailed modules, participants will explore best practices in inspection, repair, and maintenance (IRM), focusing on minimizing downtime, preventing major incidents, and extending the operational life of these critical facilities. The training incorporates real-world case studies and practical exercises to foster a deep understanding of **FPSO structural integrity**, **subsea pipeline integrity**, **corrosion management**, **failure analysis**, and **life extension strategies**. By mastering these key areas, attendees will be empowered to implement robust AIM programs that enhance operational efficiency, ensure regulatory compliance, and ultimately maximize the return on investment for their organizations.

Programme Curriculum

Training Course on Asset Integrity Management for Purpose-Built FPSO’s and Subsea System Facilities

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Course Duration

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Course Objectives

1. **Understand the Fundamentals of Asset Integrity Management (AIM):** Grasp the core principles and importance of AIM in the context of FPSO and subsea operations.
2. **Identify and Analyze Degradation Mechanisms:** Recognize common failure modes and material degradation processes affecting FPSO hulls, topsides, and subsea equipment (**degradation analysis**, **failure modes**, **material science**).
3. **Master Risk-Based Inspection (RBI) Methodologies:** Learn to apply RBI principles for prioritizing inspection efforts and optimizing maintenance schedules (**RBI implementation**, **risk assessment**, **inspection planning**).
4. **Develop Effective Inspection, Repair, and Maintenance (IRM) Strategies:** Acquire skills in planning and executing efficient IRM activities for FPSO and subsea assets (**IRM planning**, **maintenance optimization**, **repair techniques**).
5. **Implement Condition Monitoring Techniques:** Understand and utilize various condition monitoring technologies for proactive integrity management (**predictive maintenance**, **condition-based monitoring**, **sensor technology**).
6. **Apply Non-Destructive Testing (NDT) Methods:** Gain knowledge of different NDT techniques used for integrity assessment of critical components (**NDT techniques**, **inspection technology**, **structural health monitoring**).
7. **Manage Corrosion in Marine and Subsea Environments:** Learn effective corrosion prevention and control strategies for FPSO and subsea systems (**corrosion control**, **cathodic protection**, **materials selection**).
8. **Understand the Integrity of Umbilicals, Risers, and Flowlines (SURF):** Address specific integrity challenges associated with subsea SURF infrastructure (**SURF integrity**, **riser management**, **flowline integrity**).
9. **Apply Fitness-for-Service (FFS) Assessments:** Evaluate the structural integrity of damaged equipment and determine its suitability for continued operation (**FFS assessment**, **structural**

analysis, **remaining life assessment**).
10. **Develop Life Extension Strategies for Aging Assets:** Learn methodologies for extending the operational life of FPSOs and subsea facilities safely and cost-effectively (**asset life extension**, **aging asset management**, **service life prediction**).
11. **Ensure Regulatory Compliance and Industry Best Practices:** Understand relevant regulations, standards, and best practices for AIM in the offshore oil and gas sector (**regulatory compliance**, **industry standards**, **HSE management**).
12. **Utilize Data Management and Analytics for Integrity:** Learn how to collect, analyze, and interpret integrity-related data for informed decision-making (**data analytics**, **asset management software**, **digital twins**).
13. **Implement Integrity Management Systems (IMS):** Understand the framework and key elements of an effective Asset Integrity Management System (**IMS framework**, **integrity assurance**, **performance management**).

Organizational Benefits

- **Enhanced Safety Performance:** Proactive identification and mitigation of potential hazards reduce the risk of major accidents, protecting personnel and the environment.
- **Increased Asset Reliability and Availability:** Effective maintenance and inspection strategies minimize unplanned downtime, leading to higher production efficiency and throughput.
- **Reduced Operational Costs:** Optimized maintenance schedules, early detection of potential failures, and extended asset life reduce repair costs and the need for premature replacements.
- **Improved Regulatory Compliance:** Adherence to industry standards and regulations avoids potential fines and legal liabilities, enhancing the company's reputation.
- **Maximized Return on Investment (ROI):** Extending the operational life of expensive assets like FPSOs and subsea infrastructure maximizes their value and profitability.
- **Better Decision Making:** Access to comprehensive integrity data and analysis enables informed decisions regarding maintenance, repairs, and asset management strategies.
- **Enhanced Asset Performance:** Maintaining asset integrity ensures that equipment operates at its designed capacity and efficiency, optimizing production.
- **Improved Stakeholder Confidence:** Demonstrating a commitment to safety and environmental protection enhances the trust of investors, partners, and the wider community.
- **Effective Risk Management:** A structured AIM program provides a framework for identifying, assessing, and mitigating risks associated with asset operation.
- **Knowledge Transfer and Competency Building:** Training employees in AIM best practices builds internal expertise and fosters a culture of integrity management.

Target Audience

1. **Integrity Engineers and Specialists:** Professionals directly responsible for developing and implementing AIM programs.
2. **Maintenance Managers and Engineers:** Individuals involved in planning and executing maintenance activities on FPSOs and subsea systems.
3. **Inspection Personnel and Technicians:** Professionals conducting inspections and NDT on critical assets.
4. **Operations Managers and Engineers:** Personnel responsible for the safe and efficient operation of FPSO and subsea facilities.
5. **HSE (Health, Safety, and Environment) Professionals:** Individuals focused on ensuring safety and environmental compliance in offshore operations.
6. **Asset Managers and Planners:** Professionals involved in strategic asset management and long-term planning.

7. **Project Engineers:** Engineers involved in the design, construction, and commissioning of FPSO and subsea projects.
8. **New Graduates and Early-Career Professionals:** Individuals seeking to develop expertise in asset integrity management within the offshore oil and gas sector.

Course Outline

Module 1: Introduction to Asset Integrity Management

- Defining Asset Integrity and its importance in the oil and gas industry.
- Overview of the lifecycle of FPSOs and subsea system facilities.
- The role of AIM in ensuring safety, reliability, and environmental protection.
- Key elements and principles of an effective Asset Integrity Management System (AIMS).
- Economic benefits and business drivers for implementing robust AIM programs.

Module 2: Degradation Mechanisms in FPSO and Subsea Assets

- Understanding common corrosion mechanisms (general, pitting, galvanic, MIC) in marine and subsea environments.
- Fatigue cracking and its impact on FPSO hulls, risers, and subsea structures.
- Erosion and wear due to fluid flow and particle impingement.
- Material degradation due to environmental factors (UV, temperature, marine growth).
- Ageing effects and their influence on the integrity of critical components.

Module 3: Risk-Based Inspection (RBI) Methodologies

- Introduction to risk assessment and its application in integrity management.
- Qualitative and quantitative risk assessment techniques.
- Developing risk matrices and criticality assessments for equipment.
- Planning inspection activities based on risk profiles and potential consequences of failure.
- Implementing and managing an effective RBI program.

Module 4: Non-Destructive Testing (NDT) and Inspection Techniques

- Overview of various NDT methods (UT, MT, PT, RT, VT, ET).
- Application of NDT techniques for detecting flaws and anomalies in FPSO and subsea components.
- Advanced inspection technologies (e.g., phased array UT, long-range UT, digital radiography).
- Underwater inspection techniques for subsea structures and pipelines (ROV, AUV).
- Data acquisition, analysis, and reporting of inspection findings.

Module 5: Corrosion Management and Prevention

- Principles of corrosion in offshore and subsea environments.
- Cathodic protection (CP) systems for FPSOs and subsea infrastructure.
- Protective coatings and their application.
- Chemical inhibition programs for corrosion control.
- Corrosion monitoring techniques and data interpretation.

Module 6: Integrity of Umbilicals, Risers, and Flowlines (SURF)

- Design and operational considerations affecting SURF integrity.
- Specific degradation mechanisms in umbilicals, risers, and flowlines.
- Inspection and monitoring techniques for SURF systems.

- Repair and intervention strategies for subsea pipelines and risers.
- Integrity management planning for SURF assets throughout their lifecycle.

Module 7: Fitness-for-Service (FFS) Assessments

- Introduction to FFS concepts and relevant industry standards (e.g., API 579).
- Methodologies for evaluating the integrity of damaged equipment.
- Stress analysis and remaining life assessment techniques.
- Decision-making processes for repair, replacement, or continued operation.
- Practical application of FFS assessments through case studies.

Module 8: Maintenance Strategies for FPSO and Subsea Systems

- Overview of different maintenance philosophies (reactive, preventive, predictive, proactive).
- Developing and implementing preventive maintenance programs.
- Utilizing condition monitoring data for predictive maintenance.
- Planning and scheduling maintenance activities for FPSO topsides and subsea equipment.
- Optimizing maintenance resources and minimizing downtime.

Module 9: Condition Monitoring Technologies and Applications

- Introduction to various condition monitoring technologies (vibration analysis, thermography, oil analysis, acoustic emission).
- Application of these technologies for monitoring the health of rotating equipment and static structures.
- Data acquisition, processing, and interpretation of condition monitoring data.
- Integrating condition monitoring into the overall AIM program.
- Case studies demonstrating the benefits of condition-based maintenance.

Module 10: Asset Life Extension Strategies

- Principles of asset life extension for aging offshore facilities.
- Methodologies for assessing the remaining life of FPSOs and subsea systems.
- Identifying critical components and potential life-limiting factors.
- Developing and implementing life extension plans.
- Economic considerations and risk management in life extension projects.

Module 11: Regulatory Compliance and Industry Standards

- Overview of relevant international and local regulations governing offshore asset integrity.
- Key industry standards and guidelines (e.g., ISO, API, DNV).
- HSE requirements and their integration with AIM programs.
- Auditing and compliance verification processes.
- Implications of non-compliance and potential consequences.

Module 12: Data Management and Analytics in Asset Integrity

- Importance of data collection and management for effective AIM.
- Utilizing asset management software and databases for integrity data.
- Data analysis techniques for identifying trends and predicting failures.
- Developing key performance indicators (KPIs) for monitoring AIM program effectiveness.
- Introduction to digital twins and their application in asset integrity management.

Module 13: Integrity Management Systems (IMS) Implementation

- Framework and key elements of an effective IMS (e.g., ISO 55001).
- Developing policies, procedures, and work instructions for AIM activities.
- Defining roles and responsibilities within the integrity management organization.
- Implementing change management processes for integrity-related modifications.
- Performance monitoring, auditing, and continuous improvement of the IMS.

Module 14: Human Factors in Asset Integrity

- The role of human factors in asset integrity and safety.
- Identifying potential human error and its impact on asset reliability.
- Implementing strategies to mitigate human factors risks (e.g., training, procedures, ergonomics).
- Importance of communication and teamwork in integrity management.
- Safety culture and its influence on AIM program success.

Module 15: Case Studies and Best Practices in FPSO and Subsea AIM

- Review of real-world case studies of integrity incidents and their lessons learned.
- Presentation of best practices in AIM implementation from leading operators.
- Discussion of innovative technologies and approaches in asset integrity management.
- Group exercises and problem-solving scenarios related to FPSO and subsea integrity challenges.
- Developing action plans for implementing AIM improvements in participants' organizations.

Training Methodology

This training course will employ a blended learning approach to maximize engagement and knowledge retention:

- **Interactive Lectures:** Incorporating real-world examples, case studies, and Q&A sessions to facilitate understanding.
- **Group Discussions and Exercises:** Encouraging participants to share experiences and apply learned concepts through collaborative activities.
- **Case Study Analysis:** In-depth examination of relevant industry incidents and successful AIM implementations.
- **Practical Workshops:** Hands-on exercises utilizing tools and techniques relevant to asset integrity management.
- **Visual Aids and Multimedia:** Utilizing presentations, videos, and simulations to enhance learning.
- **Knowledge Checks and Quizzes:** Regular assessments to gauge understanding and reinforce key concepts.
- **Best Practice Sharing:** Facilitating the exchange of knowledge and experiences among participants.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

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