MERCURY

Advanced Mooring & SPM Integrity Management

21 – 25 February 2027
Dubai (UAE)



Dubai - UAE: +971 4 450 5697
Istanbul - Türkiye: +90 539 599 1206
Amman - Jordan: +962 79 712 3347

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Introduction

The Advanced Mooring & SPM Integrity Management course prepares professionals to understand the design, operation, inspection, and protection of offshore mooring systems throughout their service life. It explains the role of chains, wire ropes, synthetic lines, anchors, winches, and connectors in maintaining safe station keeping under challenging marine conditions. Participants will develop knowledge of load behavior, environmental impacts, corrosion, fatigue, wear, and emergency response requirements. The program highlights how integrity management improves reliability, safety, and operational continuity through effective inspection, maintenance, and technical decision-making. It introduces digital twins, smart sensors, and predictive monitoring technologies that support enhanced mooring and SPM performance.

Targeted Groups

This Advanced Mooring & SPM Integrity Management training targets professionals seeking knowledge and skills:

- Offshore marine engineers working with station-keeping systems.
- Mooring supervisors responsible for safe line handling.
- Terminal and SPM personnel managing berth operations.
- Integrity engineers focused on asset condition and risk.
- Inspection teams handling visual, remote, and underwater surveys.
- Maintenance planners controlling records, repairs, and lifecycles.
- HSE professionals supporting hazard control and emergency readiness.
- Reliability specialists adopting monitoring and digital technologies.

Course Objectives

Participants will achieve the following objectives by completing the Advanced Mooring & SPM Integrity Management course:

- Explain how mooring systems maintain station-keeping safety and operational stability in offshore environments.
- Differentiate chain, wire rope, and synthetic lines by structure, behavior, and service application.
- Apply load, tension, and environmental considerations when reviewing mooring design principles.
- Assess integrity risks linked to corrosion, fatigue, wear, overload, and reduced service condition.
- Use risk-based assessment logic to support inspection priorities, repair decisions, and life extension.
- Interpret inspection findings, monitoring data, and maintenance records for informed technical decisions.
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Strengthen operational safety through hazard awareness, communication, and emergency response planning.
- Evaluate how digital twins, smart sensors, and predictive maintenance improve mooring reliability.

Targeted Competencies

Participants will gain the following competencies during the Advanced Mooring & SPM Integrity Management program:

- Interpreting mooring layouts and component functions with confidence.
- Recognizing degradation patterns linked to corrosion, fatigue, and wear.
- Prioritizing inspection actions using risk-based integrity thinking.
- Reviewing survey results, tension trends, and technical records.
- Supporting safe operations through clear communication and hazard control.
- Planning maintenance and repair actions for continued service.
- Using digital monitoring concepts to strengthen reliability decisions.

Studying Scenarios

In this Advanced Mooring & SPM Integrity Management training, participants develop skills through the following scenarios:

- Assessing a mooring line with signs of elongation and surface wear.
- Reviewing tension data after a weather shift and deciding on actions.
- Responding to a terminal mooring alarm during cargo transfer.
- Evaluating underwater inspection findings for corrosion and connector condition.
- Selecting a life-extension response for aging but serviceable equipment.

Course Content

Unit 1: Mooring System Fundamentals and Design

- Explain the purpose of mooring systems in offshore operations.
- Identify chain, wire rope, and synthetic mooring lines.
- Understand the function of anchors, winches, and connectors.
- Review load calculation and design principles.
- Analyze environmental effects on mooring performance.
- Understand relevant mooring standards and guidelines.

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Unit 2: Integrity Management Process

- Define mooring integrity management principles.
- Identify common failure causes in mooring systems.
- Understand corrosion, fatigue, and wear effects.
- Apply risk-based methods for integrity assessment.
- Evaluate system strength and service condition.
- Explore life extension approaches and strategies.

Unit 3: Inspection, Monitoring, and Maintenance

- Explain inspection methods for mooring systems.
- Review advanced marine inspection technologies.
- Understand remote and underwater survey techniques.
- Monitor line tension and system performance.
- Apply maintenance and repair practices.
- Manage inspection data and technical records.

Unit 4: Operations and Emergency Response

- Understand safe mooring operation procedures.
- Identify hazards during mooring activities.
- Apply safe handling and communication practices.
- Review emergency response requirements.
- Develop incident control and risk response plans.
- Understand spill prevention and containment actions.

Unit 5: Emerging Technologies and Innovations

- Understand digital twins in integrity management.
- Explore real-time monitoring applications.
- Identify benefits of predictive maintenance.
- Review smart sensors for system monitoring.
- Improve inspection accuracy through technology.
- Recognize innovations supporting asset reliability.

Final Insights & Key Takeaways

This course builds a complete view of mooring performance, from design fundamentals to integrity assurance and emergency readiness. It strengthens long-term asset reliability by linking inspection discipline, operational control, and modern monitoring technologies.