
Maritime Reliability Leadership Training Course: Machinery Failures, FMEA and ISM Code Learning

4 – 8 April 2027
Muscat





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Programme Summary

Maritime reliability leadership is the subject of this one-week training course for fleet managers and technical superintendents at managerial level, ending in a reliability and safety learning pack for one vessel or fleet. Machinery failures at sea interrupt operations and expose crews to risk, yet lessons are often lost between ship and office. The programme moves from principles, through diagnosis of failures, to the design of maintenance and safety routines, and then applies them. Mars Training Centre UK delivers this maritime reliability leadership programme for ship and offshore operators.

The Business Case

A vessel that loses propulsion, power generation or a critical pump stops earning and may put people, cargo and the environment at risk, which also draws scrutiny from owners and auditors. Causes recorded only as symptoms let failures repeat, so analysis must reach maintenance planning before the next port call. Leaders who link failure analysis to maintenance priorities and the safety management system reduce repeat events.

- Unplanned Machinery Downtime: Falls as critical equipment is ranked by risk and maintained accordingly.
- Repeat Failure Rate: Reduces as causes are traced to a corrective action.
- Safety Management Effectiveness: Improves as incident and near-miss lessons feed back into procedures.

Principles and Evidence Base

- ISM Code of the International Maritime Organization: It frames the safety management system and review routines examined in Sessions 1, 4 and 5.
- FMEA, failure modes and effects analysis IEC 60812: It structures the machinery failure analysis built in Sessions 2 and 3.
- ISO 31000 risk management: It supplies the risk criteria used to rank equipment and maintenance tasks in Sessions 2 and 3.
- Reliability-centred maintenance: It guides the choice of maintenance strategy for critical machinery in Session 3.



Intended Participants

- Fleet managers accountable for vessel availability and condition.
- Technical superintendents who direct maintenance on board and ashore.
- Operations directors who balance schedule, cost and safety.
- Safety managers who run the safety management system and its audits.

The programme serves merchant shipping, offshore support and port operations, and suits mixed groups.

Learning Outcomes

1. Participants will be able to evaluate the criticality of vessel machinery using a risk-based ranking.
2. Participants will be able to diagnose the causes of a machinery failure using FMEA and structured questioning.
3. Participants will be able to construct a maintenance strategy for critical equipment using reliability-centred logic.
4. Participants will be able to prioritise corrective actions from incidents and near misses.
5. Participants will be able to justify maintenance and safety decisions to owners and auditors.
6. Participants will be able to design a review routine that turns failure data into fleet-wide learning.

Programme Structure

Day 1: Maritime Reliability Leadership Principles and Safety Management

How do reliability and safety management work together on a vessel?

- Reliability and Safety Management Link
- ISM Code Safety Management System Elements
- Machinery Failure Modes at Sea
- Reliability Indicator Set for Vessels
- Company and Ship Responsibility Map

Day 2: Diagnosing Machinery Failures and Fleet Risk

Where do failures start, and which equipment carries the most risk?

- Equipment Criticality Ranking
- FMEA Worksheet for Propulsion and Power Plant
- ISO 31000 Risk Criteria
- Failure Record Quality Review
- Near-Miss and Incident Pattern Log



Day 3: Designing Maintenance Strategy and Risk Controls

How is maintenance matched to the risk that each machine carries?

- Reliability-Centred Maintenance Decision Logic
- Condition Monitoring Selection Guide
- Risk-Based Maintenance Task Plan
- Spare Parts Criticality Review
- Dry-Dock and Port Stay Work Sequencing

Day 4: Learning from Incidents and Managing Change

How do incidents lead to corrective action that holds?

- Root Cause Investigation Method
- Corrective Action Verification Sheet
- Non-Conformity and Audit Finding Review
- Management of Change Checklist
- Shore to Ship Feedback Loop

Day 5: Applying Maritime Reliability Leadership to One Vessel or Fleet

Is the learning pack ready to be used by the company and the ship?

- Applying the Session 2 Criticality Ranking to the Chosen Vessel
- Testing the Session 3 Maintenance Plan against Risk
- Reviewing the Session 4 Action Verification Sheet
- Rehearsing the Owner and Auditor Briefing
- Completing the Reliability and Safety Learning Pack

Methodology

The programme uses a case analysis method built on anonymised machinery failure reports, maintenance records and safety management audit findings. Small groups present their analysis to a mock senior review panel, receive structured feedback from peers and the facilitator, and revise each work product before it enters the learning pack.

- Suggested activity: Building an FMEA worksheet for a main engine or generator failure.
- Suggested activity: Ranking equipment by criticality and defending the order.
- Suggested activity: Tracing a repeat failure to its root cause and writing a verified corrective action.



Capstone Output

Each participant completes a reliability and safety learning pack for one vessel or fleet. It holds a criticality ranking, an FMEA worksheet, a risk-based maintenance plan, a corrective action register and a briefing note. The pack is used at work to set maintenance priorities, brief owners and auditors, and feed lessons back into procedures.

Frequently Asked Questions

Is maritime reliability leadership suitable for managers who do not come from an engineering background?

Yes. Maritime reliability leadership assumes responsibility for vessel availability or safety, not detailed engineering design, and starts from basic ideas.

Which standards does maritime reliability leadership rest on in this programme?

Maritime reliability leadership here rests on the ISM Code, FMEA under IEC 60812, ISO 31000 risk management and reliability-centred maintenance.

How is the learning pack from maritime reliability leadership used at work?

You use the learning pack to set maintenance priorities, brief owners and auditors, and carry incident lessons into the safety management system.

How does maritime reliability leadership differ from a programme on marine engineering maintenance?

Maritime reliability leadership centres on risk ranking, failure learning and management decisions across the fleet, while marine engineering maintenance centres on hands-on repair of machinery.