MAWA EVENTS

Address: No. 857, Block A2. Leisure Commerce Square - No 9., 46150 Petaling Jaya, Selangor, Malaysia

Phone: +601116373203 | **Email:** info@mawaevents.net

RISK AND RELIABILITY ENGINEERING AND MANAGEMENT

"Engineering Resilient Systems through Risk-Based Decision-Making and Reliability Strategies"

Schedule

Date	Venue	Fees (Face-to-Face)
23 – 27 Nov 2026	London – UK	USD 3495 per delegate

► **Available delivery methods:** Face-to-Face & Online Training

Introduction

In today's high-stakes engineering and operational environments, managing risk and enhancing reliability are critical to safety, performance, and cost-effectiveness. Failures in complex systems can lead to significant downtime, financial loss, and reputational damage. Risk and reliability engineering enables organizations to proactively assess threats, design for robustness, and optimize maintenance strategies.

This training course provides participants with an integrated approach to engineering risk and reliability management, blending proven methodologies with practical applications. Participants will learn how to assess, quantify, and mitigate technical and operational risks while improving asset performance and lifecycle value.

Objectives

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

- Apply reliability and risk engineering principles to systems and assets
- Conduct Failure Mode and Effects Analysis (FMEA), Fault Tree Analysis (FTA), and Root Cause Analysis (RCA)
- Use RAM (Reliability, Availability, Maintainability) modeling and reliability data
- Design and implement risk mitigation strategies and condition-based maintenance programs
- Integrate reliability engineering into safety, quality, and operational excellence frameworks

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Why Attend

- Strengthen engineering and operational decision-making through risk-informed strategies
- Enhance equipment availability and system uptime using reliability techniques
- Learn internationally accepted methods for risk and reliability evaluation
- Improve maintenance planning, asset utilization, and lifecycle cost control
- Support safety, quality, and environmental objectives through better risk management

Target Audience

This program is designed for:

- Reliability engineers and maintenance professionals
- Operations and asset managers
- Design, safety, and project engineers
- Risk analysts and HSE specialists
- Quality managers and systems engineers

Individual Benefits

Key competencies that will be developed include:

- Risk assessment and reliability evaluation techniques
- Failure analysis and system modeling
- Design for reliability and maintainability (DFR, DFM)
- Decision-making under uncertainty
- Linking reliability to quality, safety, and cost performance

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Improved asset reliability, reduced unplanned downtime
- Better risk visibility and mitigation across technical systems
- Enhanced engineering and maintenance strategies
- Compliance with safety and reliability standards (ISO 31000, IEC 61025, etc.)
- Stronger culture of proactive risk and failure prevention

Instructional Methodology

The course follows a blended learning approach combining theory with practice:

- Strategy Briefings – Risk management frameworks, reliability models, and failure analysis tools
- Case Studies – Reliability failures, critical incidents, and system design improvements
- Workshops – Hands-on exercises using FMEA, FTA, RCA, and RAM models
- Peer Exchange – Experience-sharing on reliability challenges and solutions across industries
- Tools – Templates, checklists, modeling tools, and analysis reports for practical use

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Course Outline

Detailed 5-Day Course Outline

Training Hours: 7:30 AM – 3:30 PM **Daily Format:** 3–4 Learning Modules | Coffee breaks: 09:30 & 11:15 | Lunch Buffet: 01:00 – 02:00

Day 1: Introduction to Risk and Reliability Engineering

- Module 1: Fundamentals of Risk and Reliability (07:30 – 09:30) • Definition of risk, reliability, and their interrelationship • Types of failure and reliability metrics • Key standards and best practices (ISO, IEC, MIL, etc.)
- Module 2: System Reliability Concepts (09:45 – 11:15) • Series and parallel systems • Mean Time Between Failures (MTBF), Failure Rate, Availability
- Module 3: Workshop – Reliability Block Diagram (RBD) Modeling (11:30 – 01:00) • Model a simple system using RBDs and calculate availability
- Module 4: Peer Exchange – Common Failure Patterns (02:00 – 03:30) • Group discussion on real-world reliability challenges

Day 2: Failure Analysis and Risk Assessment Techniques

- Module 5: Failure Mode and Effects Analysis (FMEA) (07:30 – 09:30) • FMEA process, scoring, and criticality analysis • Design vs. Process FMEA
- Module 6: Fault Tree Analysis (FTA) and Event Trees (09:45 – 11:15) • Top-down risk modeling and Boolean logic • Qualitative and quantitative FTA
- Module 7: Workshop – FMEA and FTA for a Mechanical System (11:30 – 01:00) • Hands-on risk identification and modeling
- Module 8: Case Study – Catastrophic Failure Investigation (02:00 – 03:30) • Analyze root causes and missed controls

Day 3: RAM and Maintenance Optimization

- Module 9: RAM (Reliability, Availability, Maintainability) Modeling (07:30 – 09:30) • Concepts, inputs, and use in system design • Case applications in oil & gas, power, and transport
- Module 10: Maintenance Strategy Development (09:45 – 11:15) • Corrective, preventive, and predictive maintenance • Risk-based and reliability-centered maintenance (RCM)
- Module 11: Workshop – Maintenance Optimization Strategy (11:30 – 01:00) • Define a CBM plan based on failure data
- Module 12: Peer Exchange – Maintenance Effectiveness Review (02:00 – 03:30) • Group insights on reliability improvement practices

Day 4: Reliability in Design, Safety and Quality

- Module 13: Design for Reliability and Maintainability (07:30 – 09:30) • DFR process in engineering projects • Material selection, redundancy, and access considerations
- Module 14: Linking Reliability to Safety and Quality (09:45 – 11:15) • Integrated risk and quality management • Human error and risk reduction
- Module 15: Workshop – Designing a High-Reliability System (11:30 – 01:00) • Review and improve a sample system design
- Module 16: Case Study – High Reliability Organizations (02:00 – 03:30) • Lessons from nuclear, aviation, and healthcare sectors

Day 5: Decision-Making, Communication, and Improvement Planning

- Module 17: Decision-Making Under Uncertainty (07:30 – 09:30) • Bayesian analysis, sensitivity analysis, risk tolerance
- Module 18: Reliability Metrics and Dashboards (09:45 – 11:15) • Selecting KPIs and visualizing system performance
- Module 19: Final Group Project – Reliability Improvement Plan (11:30 – 01:00) • Present a risk and reliability plan for a case system
- Module 20: Wrap-Up, Certification, and Q&A (02:00 – 03:30) • Course review, feedback, and certificate distribution

Certification

Participants will receive a Certificate of Completion in Risk and Reliability Engineering and Management, validating their expertise in applying structured risk analysis and reliability engineering to enhance system performance, safety, and cost-effectiveness.

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Why Choose MAWA Events

- **Global Expertise:** More than 17 years of experience in professional training and consulting.
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In-House / Customized Training Interested in running this course for your team? Please contact us:	TEL: **+601116373203**	EMAIL: **info@mawaevents.net**