
Reliability-Centred Maintenance Analysis and Strategy Design Training Course

5 – 9 July 2027
Cape town





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Programme Summary

Reliability-centred maintenance analysis and strategy design is a five-day training course for maintenance, reliability and engineering leaders at advanced level, culminating in an RCM-based maintenance strategy and implementation plan for a critical system. Many maintenance programmes grew task by task from manufacturer manuals and past incidents, so no one can say which tasks protect which functions. The approach moves from functions and failure consequences through RCM decision logic to task selection, intervals and cost-effective implementation. Mars Training Centre UK delivers this programme in reliability-centred maintenance for oil, gas, power and process plants.

The Business Case

An inherited maintenance programme usually mixes essential tasks with work that adds cost but protects nothing, while some hidden failures that matter most are never tested. RCM gives leaders a defensible basis for every task and a clear record of why it exists, so budgets, audits and regulators can be answered with evidence.

- Maintenance Cost: Falls as tasks without a failure mode to manage are removed.
- Safety and Environmental Risk: Reduces as hidden failures of protective devices receive failure-finding tasks.
- Production Availability: Improves as tasks target the failure modes with operational consequences.

Principles and Evidence Base

- SAE JA1011: Its evaluation criteria and seven questions define what counts as RCM throughout Sessions 1 to 3.
- SAE JA1012: Its guidance on applying the standard shapes the consequence and task logic in Sessions 2 and 3.
- IEC 60300-3-11: Its application guide for RCM informs scoping, review groups and living RCM in Session 4.
- ISO 55001: Its asset management system requirements frame strategy approval and audit in Session 5.

Intended Participants

- Leaders who own the maintenance strategy for production systems and facilities.
- Managers who sponsor RCM studies and approve their recommendations.
- Engineering heads who decide on redesign when no maintenance task is adequate.
- Reliability leads who must keep maintenance programmes current as operating conditions change.



The programme serves upstream oil and gas, refining and petrochemicals, power generation and water utilities.

Learning Outcomes

1. Participants will be able to define functions, performance standards and functional failures for a system in its operating context.
2. Participants will be able to evaluate failure consequences across hidden, safety, environmental, operational and economic categories.
3. Participants will be able to select task types and default actions using RCM decision logic.
4. Participants will be able to justify task intervals from failure behaviour and consequence.
5. Participants will be able to design an RCM review process with scoping, facilitation and living RCM updates.
6. Participants will be able to construct an implementation plan with business case and audit arrangements.

Programme Structure

Day 1: Reliability-Centred Maintenance Foundations and Functions

What must the system do, and what does failure mean in its context?

- Origins of RCM and the SAE JA1011 Seven Questions
- Operating Context Statements
- Primary and Secondary Functions with Performance Standards
- Functional Failures and Partial Loss of Function
- Criticality-Based Scoping of RCM Studies

Day 2: Failure Modes, Effects and Consequences

How does each failure happen, and how much does it matter?

- Failure Mode Identification and Level of Detail
- Failure Effects Descriptions for Decision-Making
- Hidden Failure Consequences and Protective Devices
- Safety, Environmental and Operational Consequences
- Non-Operational and Economic Consequences

Day 3: RCM Decision Logic and Task Selection

Which task, if any, is technically feasible and worth doing?



- SAE JA1012 Decision Diagram Application
- On-Condition, Scheduled Restoration and Scheduled Discard Tasks
- Failure-Finding Tasks and Interval Calculation
- Default Actions: Redesign and Run to Failure
- Task Interval Setting from Failure Behaviour

Day 4: Running RCM Reviews and Living RCM

How are RCM studies organised, governed and kept current?

- Review Group Composition and Facilitator Role
- IEC 60300-3-11 Process Steps and Documentation
- Streamlined and Template Approaches Compared
- Living RCM Triggers from Failures and Changes
- Quality Review of RCM Worksheets

Day 5: Applying RCM to Maintenance Strategy Implementation

How is the analysis turned into a funded, controlled maintenance programme?

- Converting Day 3 Decisions into CMMS Task Lists
- Business Case from Day 2 Consequences and Task Costs
- Change Management for Crews and Operations Teams
- ISO 55001 Approval, Audit and Performance Review
- RCM-Based Maintenance Strategy and Implementation Plan Completion

Methodology

The programme uses structured exercises on worked systems from oil and gas, power and water facilities. Participants complete RCM worksheets in small review groups, rotating the facilitator role, and test their decisions against the SAE JA1011 criteria. Each session closes with a peer review of the worksheet produced.

- Suggested activity: Writing function statements for a seawater injection pump system.
- Suggested activity: Setting a failure-finding interval for a high-level trip on a separator.
- Suggested activity: Building the business case for revising a gas turbine maintenance plan.

Capstone Output

Each participant completes an RCM-based maintenance strategy and implementation plan for a critical system from their own facility or a case study. It contains scope, function and failure analysis extracts, task decisions with intervals, redesign actions, the business case and audit arrangements.



Frequently Asked Questions

Is reliability-centred maintenance training suitable for managers who will sponsor rather than facilitate studies?

Yes. It is set at advanced level for leaders who own maintenance strategy. It assumes maintenance or engineering experience and gives enough hands-on analysis to judge and govern RCM work.

Which standards does reliability-centred maintenance analysis rest on?

It rests on SAE JA1011 and SAE JA1012 for RCM criteria and logic, IEC 60300-3-11 for application, and ISO 55001 for alignment with the asset management system.

How is the RCM-based maintenance strategy used at work?

You can use it to secure approval for a revised maintenance programme and as the plan for loading new tasks into the CMMS.

How does reliability-centred maintenance differ from condition monitoring training?

It decides which tasks a system needs and why, while condition monitoring training concentrates on how on-condition tasks are carried out.