

# Availability, Reliability and Maintainability (ARM) Analysis

## Purpose

To enable students to apply appropriate ARM methodologies to projects, ensuring that ARM is included within the design and that ARM targets are met. The module also discusses the concept of critical and life-limited items and the use of reliability centred maintenance strategies to reduce maintenance costs. Finally the module considers the trade-offs between ARM and safety requirements, as well as discussing how ARM shortfalls may be addressed.

## At the end of the course you will be able to

1. Identify and apply the analysis methodologies to systems and sub-systems, including both design and operation restrictions, to determine the Availability, Reliability and Maintainability of these Systems.
2. Critically review and balance the requirements of the design for ARM and safety.
3. Logically deduce how ARM results for a system may be improved.

## Outline content

Introduction to Availability, Reliability and Maintainability (ARM):

- Definition of terms
- Importance of ARM
- Defining the mission
- ARM targets and target apportionment

Availability and safety – potential conflicts

- Differences between safety and ARM
- Claims on repair

ARM planning and choice of methodology

- ARM planning
- Interpreting ARM targets
- Incorporating ARM into the design
- Choice of methodology
- Dealing with ARM shortfalls

ARM assessment methods – deterministic

- Failure modes, effects and criticality analysis (FMECAs)
- Categorising component failures
- Limitations of FMECA
- Functional block diagrams

Numerical ARM assessment techniques

- Parts counts
- Fault tree analysis
- Reliability block diagrams

Critical and life limited items

- Critical items – novel, expensive, difficult to repair

- Limited life items

Maintainability and maintainability demonstrations

- Incorporation of maintenance into design

Reliability Centred Maintenance (RCM)

- Definitions of RCM
- Processes, requirements and limitations

Methods of improving reliability

## Recommended prior study

Education, skills or experience equivalent to undergraduate level

Risktec module: *Principles of Risk Management*

## Who should attend

Managers, discipline engineers and HSE and reliability professionals seeking to improve asset performance.

## Delivery Methods

Face-to-face, Distance Learning, or Blended Learning

## Levels of Assessment

- Attendance only
- Assessment by Risktec
- Risktec Professional Qualifications
- Postgraduate Qualifications: PgCert, PgDip and MSc

## Assessment details

Postgraduate programmes: activities and assignment (total about 80 hours)

RPQ programmes: assignment (about 15 hours)

## Module details

Level	Masters/RPQ
Duration	2 days (F2F), 8 weeks (Postgraduate or RPQ DL)

## Price

For prices and further information, or to book a course, please contact **Vicky Billingham** at [training@risktec.tuv.com](mailto:training@risktec.tuv.com)

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