



Maintenance & Reliability Management

Reliability-Centered Design Principles

Course Introduction

Reliability-Centred Design (RCD) is a structured approach to designing products and systems with reliability as a key goal. By focusing on preventing failures and ensuring performance, RCD helps organizations create more robust, efficient, and cost-effective systems. It plays a crucial role in reducing operational downtime, minimizing maintenance costs, and enhancing customer satisfaction.

This training program covers the fundamental principles of RCD, including functional requirements, failure analysis, and design for reliability. Participants will also learn techniques such as Failure Modes, Effects, and Criticality Analysis (FMECA) and how to implement these principles in engineering projects.

Target Audience

This course is designed for engineers, designers, project managers, and reliability professionals involved in product or system design and development.

Learning Objectives

- Understand the key principles and process of Reliability-Centred Design (RCD).
- Learn how to define system and functional requirements that align with reliability goals.
- Gain skills in using Failure Modes, Effects, and Criticality Analysis (FMECA) to identify and mitigate risks.
- Learn how to apply design techniques that enhance the reliability of products and systems.

- Understand how to implement and measure RCD principles in engineering projects for long-term success.

Course Outline

• 01 DAY ONE

Introduction to Reliability-Centred Design (RCD)

- What is Reliability-Centred Design (RCD)?
- The importance of reliability in product and system design
- Key principles of RCD and its role in engineering
- How RCD helps in reducing maintenance costs and improving performance
- The relationship between RCD and other design approaches (e.g., Design for Reliability)
- The RCD process: from requirements to analysis
- Challenges in applying RCD in real-world projects

• 02 DAY TWO

Establishing System and Functional Requirements

- Defining system objectives and functional requirements
- Identifying critical system components and their functions
- The importance of stakeholder input in defining requirements
- Creating detailed functional specifications
- How to ensure the system meets operational needs and performance targets
- Aligning design with reliability goals
- Methods for validating functional requirements during design

• 03 DAY THREE

Failure Modes, Effects, and Criticality Analysis (FMECA)

- Introduction to Failure Modes, Effects, and Criticality Analysis (FMECA)
- How to identify potential failure modes in system components
- Evaluating the effects of failure on system performance
- Understanding the criticality of different failure modes
- How to use FMECA results to prioritize design decisions

- Integrating FMECA into the reliability design process
- Case studies of FMECA in product development and system design

• 04 DAY FOUR

Design for Reliability Techniques

- Overview of design techniques that improve reliability
- Using redundancy and fail-safe designs
- Selecting materials and components for maximum reliability
- Stressing the importance of design simplicity and ease of maintenance
- How to use simulations and modeling for reliability testing
- Reliability testing methods (accelerated life testing, stress testing)
- Incorporating user feedback into design improvements

• 05 DAY FIVE

Implementing Reliability-Centred Design in Projects

- Steps for implementing RCD principles in engineering projects
- Managing the design lifecycle with reliability as a focus
- How to measure reliability during the design phase
- Monitoring performance and failure rates post-launch
- Tools and software for tracking and improving reliability
- Creating a culture of reliability within project teams

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
June 15, 2025	June 19, 2025	5 days	4250.00 \$	KSA - El Dammam
July 21, 2025	July 25, 2025	5 days	5950.00 \$	USA - Texas
Oct. 13, 2025	Oct. 17, 2025	5 days	4250.00 \$	UAE - Abu Dhabi

