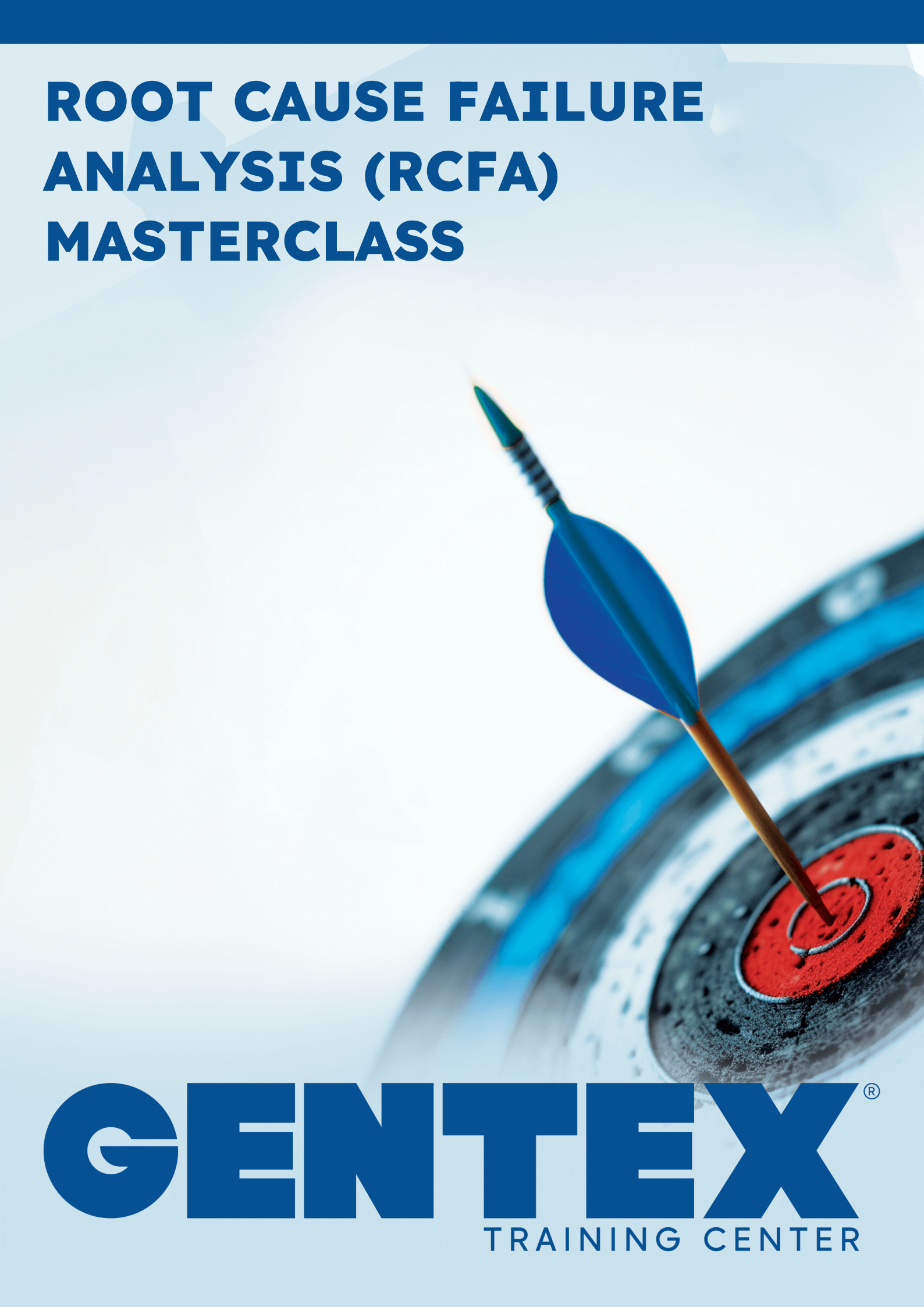
ROOT CAUSE FAILURE ANALYSIS (RCFA) MASTERCLASS



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Introduction

Root Cause Failure Analysis (RCFA) Masterclass Training Course prepares reliability and maintenance professionals to investigate failures until the true cause is found. Participants work through failure behaviour and reliability fundamentals, evidence gathering and failure data, structured analysis methods including the 5 Whys, fishbone, and fault tree analysis, human and organisational factors, corrective action design and verification, and failure reporting, trending, and prevention as one connected discipline. The programme links the repeated failures an operation suffers with the verified fixes that stop them returning. As a result, learners gain a practical method for root cause failure analysis. Furthermore, the course strengthens analytical rigour, evidence discipline, and reliability thinking.

Root Cause Failure Analysis (RCFA) Masterclass Course Objectives

- Explain failure behaviour and reliability fundamentals.
- Distinguish physical, human, and latent root causes.
- Apply failure data collection, coding, and evidence preservation.
- Apply the 5 Whys and cause-and-effect (fishbone) analysis.
- Apply fault tree analysis (FTA) and event and causal factor charting.
- Apply failure modes and effects analysis (FMEA) in investigations.
- Apply change analysis and barrier analysis techniques.
- Assess human and organisational factors in failure.
- Design corrective actions and verify their effectiveness.
- Apply failure reporting, trending, and recurrence prevention.

Course Methodology

- Interactive sessions built on real equipment and process failure cases.

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- Workshops on the 5 Whys, fishbone, fault tree, and change analysis.
- Group exercises on evidence gathering and causal factor charting.
- Hands-on practice with failure reports, trending logs, and FMEA worksheets.
- Simulation of a full failure investigation from evidence to verification.
- Facilitator coaching and peer review on personal investigation reports.

Who Should Take This Course

- Reliability engineers and maintenance engineers.
- Maintenance planners, supervisors, and technicians.
- Asset management and plant operations professionals.
- HSE and process safety investigators.
- Quality and continuous improvement specialists.
- Consultants advising on reliability and failure investigation.

Root Cause Failure Analysis (RCFA) Masterclass Course Outlines

Day 1: Failure Behaviour and Reliability Fundamentals

- Reliability definitions, failure rate, and the bathtub curve.
- Failure patterns: random, age-related, and infant mortality.
- Physical, human, and latent root causes explained.
- The cost of repeated failure and its business impact.
- Reactive, preventive, and predictive maintenance links.
- Reliability metrics: MTBF, MTTR, and availability.
- Case discussion: a failure fixed three times and never solved.

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Day 2: Evidence Gathering and Failure Data

- Preserving the failed item and the failure scene.
- Interviews, photographs, and physical evidence capture.
- Failure data collection forms and coding systems.
- Failure history, work orders, and CMMS records.
- Data quality, gaps, and reliability of testimony.
- Establishing the failure timeline and sequence.
- Workshop: gathering and coding evidence from a failure case.

Day 3: Structured Analysis Methods

- The 5 Whys and disciplined questioning technique.
- Cause-and-effect (fishbone) analysis and categorization.
- Fault tree analysis (FTA) and logic gate construction.
- Event and causal factor charting.
- Change analysis and barrier analysis.
- Failure modes and effects analysis (FMEA) in investigation.
- Exercise: analysing a single failure with three different tools.

Day 4: Human Factors and Corrective Action

- Human error types, slips, lapses, and mistakes.
- Organisational and management system influences.
- Safety culture, procedures, and competence factors.
- Designing corrective actions at the right level.
- Immediate containment versus permanent correction.

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- Action ownership, timelines, and tracking.
- Simulation: designing and defending a corrective action plan.

Day 5: Reporting, Trending, and Prevention

- Writing the failure investigation report.
- Communicating findings to management and teams.
- Verification of corrective action effectiveness.
- Failure trending, Pareto analysis, and reliability review.
- Feeding results into maintenance strategy and design.
- Building a learning organisation and knowledge base.
- Capstone: presenting a complete root cause failure investigation.

Conclusion

By successfully completing Root Cause Failure Analysis (RCFA) Masterclass, participants will gain a practical command of failure behaviour and reliability fundamentals, evidence gathering and failure data, structured analysis methods including the 5 Whys, fishbone and fault tree analysis, human and organisational factor assessment, corrective action design and verification, and failure reporting, trending and prevention. They will acquire skills in evidence preservation, causal analysis, corrective action design, and failure trending that stop repeat failures. Gentex Training Center designs the programme to help professionals investigate failure with confidence.

FAQs for the Root Cause Failure Analysis (RCFA) Masterclass course

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Q1 What is the "Root Cause Failure Analysis (RCFA) Masterclass" course about?

It prepares reliability and maintenance professionals to investigate failures until the true cause is found. The course spans failure behaviour and reliability fundamentals, evidence gathering and failure data, structured analysis methods, human factors and corrective action, and reporting, trending and prevention.

Q2 What are the key benefits of the "Root Cause Failure Analysis (RCFA) Masterclass" course?

You gain a practical method for root cause failure analysis that links the repeated failures an operation suffers with the verified fixes that stop them returning. The course improves evidence gathering and failure data quality, strengthens causal analysis with several proven tools, sharpens human factor assessment, and gives you corrective action verification and trending practice that reduces repeat failures and cost.

Q3 What skills will I gain from the "Root Cause Failure Analysis (RCFA) Masterclass" course?

You will develop four core skills: failure behaviour and reliability analysis, failure evidence gathering and data quality, causal analysis with the 5 Whys, fishbone, fault tree and FMEA, and corrective action design with effectiveness verification and failure trending.

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Q4 What tools, methods, or standards are covered in the "Root Cause Failure Analysis (RCFA) Masterclass" course?

The course covers reliability definitions, failure rate and the bathtub curve, failure patterns of random, age-related and infant mortality, physical, human and latent root causes, the cost of repeated failure, reactive, preventive and predictive maintenance links, reliability metrics of MTBF, MTTR and availability, preserving the failed item and the failure scene, interviews, photographs and physical evidence capture, failure data collection forms and coding systems, failure history, work orders and CMMS records, establishing the failure timeline and sequence, the 5 Whys and disciplined questioning technique, cause-and-effect (fishbone) analysis and categorization, fault tree analysis (FTA) and logic gate construction, event and causal factor charting, change analysis and barrier analysis, failure modes and effects analysis (FMEA) in investigation, human error types across slips, lapses and mistakes, organisational and management system influences, safety culture, procedures and competence factors, designing corrective actions at the right level, immediate containment versus permanent correction, action ownership, timelines and tracking, writing the failure investigation report, communicating findings to management and teams, verification of corrective action effectiveness, failure trending, Pareto analysis and reliability review, feeding results into maintenance strategy and design, and building a learning organisation and knowledge base.

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Q5 How is the "Root Cause Failure Analysis (RCFA) Masterclass" course applied in real-world practice?

Participants apply it to real work such as gathering and coding evidence from a failure case, analysing a single failure with the 5 Whys, fishbone and fault tree analysis, assessing human and organisational factors, designing and defending a corrective action plan, verifying corrective action effectiveness, trending failures with Pareto analysis, and presenting a full investigation report. The same methods support maintenance strategy review and knowledge base building.