BLACKBIRD FOR TRAINING

# Root Cause Analysis in Aviation System

4 – 8 October 2027
Berlin (Germany)



# Root Cause Analysis in Aviation System

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## Introduction

Welcome to the Root Cause Analysis in Aviation Systems course, an intensive program designed to provide participants with the knowledge and practical skills required to investigate incidents, identify underlying causes, and improve safety performance in aviation environments. In an industry where safety, reliability, and precision are critical, root cause analysis plays a central role in understanding why failures occur and how they can be prevented from happening again.

This course focuses on strengthening participants' ability to apply structured root cause analysis methods within aviation systems, maintenance operations, and safety investigations. It explores the tools, frameworks, and analytical approaches used to examine incidents, accidents, and system failures, while also highlighting the importance of corrective action, preventive measures, and organizational learning. By the end of the program, participants will be better prepared to support safer operations, stronger risk management, and a more proactive safety culture across aviation organizations.

## Course Objectives

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

- Understand the importance of root cause analysis in aviation safety and operational reliability.
- Learn the key concepts, terminology, and methodologies used in aviation root cause investigations.
- Apply common frameworks such as the 5 Whys, fault tree analysis, and fishbone diagrams.
- Collect, validate, and analyze data effectively during investigations and safety reviews.
- Strengthen problem-solving and critical thinking skills for identifying root causes and contributing factors.
- Develop corrective and preventive actions that are practical, effective, and risk-based.
- Support safety culture, continuous improvement, and organizational learning within aviation systems.



# Course Outlines

## Day 1: Introduction to Root Cause Analysis in Aviation Systems

- Understand the purpose and value of root cause analysis in aviation safety and performance improvement.
- Explore the relationship between incidents, accidents, system failures, and underlying causes.
- Review the main stages of the root cause analysis process in aviation environments.
- Identify key concepts in aviation safety analysis and their relevance to operational risk management.
- Examine how root cause analysis supports compliance, prevention, and long-term safety improvement.

## Day 2: Key Concepts and Methodologies in Root Cause Analysis

- Learn the core concepts, terminology, and principles used in root cause analysis.
- Review common methodologies and techniques applied in aviation investigations and maintenance analysis.
- Explore the role of data collection in identifying causes and supporting evidence-based conclusions.
- Understand how to select appropriate tools and methods depending on the nature of the event or failure.
- Develop awareness of the importance of consistency, objectivity, and accuracy in the analytical process.

## Day 3: Root Cause Analysis Frameworks and Approaches

- Understand the structure and application of the 5 Whys technique in aviation problem solving.
- Learn how fault tree analysis is used to examine system failures and breakdown pathways.
- Explore different analytical frameworks used across aviation investigations and safety reviews.
- Compare the strengths and limitations of various root cause analysis approaches.
- Practice selecting the most suitable framework for different aviation scenarios and operational issues.

## Day 4: Fishbone Diagrams and Cause-and-Effect Analysis

- Learn how to use fishbone diagrams to organize possible causes of aviation incidents and failures.
- Understand cause-and-effect analysis and how it supports structured problem investigation.
- Explore data analysis techniques used for root cause identification and validation.
- Review aviation case studies to understand how contributing factors are identified in real situations.
- Apply best practices in aviation accident analysis to improve the quality and depth of investigations.



### Day 5: Developing and Implementing Corrective Actions

- Learn how to translate investigation findings into practical corrective and preventive actions.
- Understand how risk management considerations influence action planning and implementation.
- Explore methods for evaluating the feasibility, effectiveness, and sustainability of corrective measures.
- Examine how root cause analysis contributes to stronger safety culture and continuous improvement.
- Develop strategies for sharing lessons learned and strengthening organizational learning across aviation operations.

## Why Attend This Course: Wins & Losses!

- Stronger Investigation Skills: Gain the ability to identify the true causes behind aviation incidents and failures.
- Improved Safety Awareness: Understand how root cause analysis strengthens aviation safety and reduces repeat events.
- Better Analytical Capability: Learn practical tools for data collection, cause evaluation, and structured investigation.
- More Effective Corrective Action: Build the skills needed to develop solutions that address problems at their source.
- Support for Safety Culture: Contribute to continuous improvement and stronger organizational learning in aviation environments.

## Conclusion

The Root Cause Analysis in Aviation Systems course provides a practical and structured approach to understanding why incidents, failures, and safety events occur in aviation environments. It equips participants with the knowledge and tools required to investigate problems systematically, identify root causes accurately, and develop corrective actions that improve safety and reliability.

**By the end of the course, participants will be better prepared to contribute to aviation safety investigations, maintenance analysis, and risk management processes with greater confidence and effectiveness. Whether working in aviation safety, technical operations, maintenance, or system support, participants will leave with stronger analytical skills and a clearer understanding of how root cause analysis supports safer and more resilient aviation systems.**

