

Advanced Aviation Safety Management, Accident Investigation, Root Cause Analysis & Safety Leadership

21 March – 8 April 2027
Cairo (Egypt)

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Introduction

Aviation safety depends on much more than regulatory compliance and technical excellence—it requires a systematic approach to identifying hazards, investigating occurrences, understanding why failures happen, and developing leaders capable of driving continuous safety improvement. As aviation systems become increasingly complex, organizations must strengthen their ability to conduct professional accident investigations, perform comprehensive root cause analyses, implement effective corrective actions, and cultivate a proactive safety culture that minimizes operational risk while improving organizational resilience.

The Advanced Aviation Safety, Accident Investigation, Root Cause Analysis & Safety Leadership program is a comprehensive 15-day training course designed to integrate the essential disciplines of aviation safety management, accident investigation, root cause analysis, and safety leadership into one structured learning journey. Rather than treating these topics as separate functions, the program demonstrates how they work together to support operational excellence, regulatory compliance, risk management, and continuous organizational improvement across aviation organizations.

Throughout the program, participants examine international aviation safety standards, including ICAO Annexes 13 and 19, while developing practical competencies in accident investigation methodologies, evidence collection, human factors analysis, organizational factors, safety management systems, analytical investigation techniques, fault tree analysis, fishbone diagrams, Five Whys methodology, corrective and preventive action planning, leadership communication, crisis management, organizational resilience, and safety culture development. Practical workshops, investigation simulations, aviation case studies, and real operational scenarios enable participants to apply internationally recognized best practices within realistic aviation environments.

By integrating aviation safety principles with structured investigation methodologies, advanced analytical tools, and modern safety leadership practices, this program equips participants with the knowledge, practical skills, and strategic perspective required to prevent accidents, improve safety performance, strengthen organizational learning, enhance regulatory compliance, and lead sustainable safety excellence throughout the aviation industry.

Course Objectives

By the end of this Advanced Aviation Safety, Accident Investigation, Root Cause Analysis & Safety Leadership program, participants will be able to:

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A graphic of a chessboard with several chess pieces (a king, a queen, a rook, and a pawn) positioned on it. The board is white and black, and the pieces are gold and silver.

- Understand international aviation safety principles, standards, and regulatory frameworks governing aviation operations.
- Apply the requirements of ICAO Annex 13 and Annex 19 within aviation safety management and accident investigation activities.
- Strengthen knowledge of Safety Management Systems SMS and their role in hazard identification and operational risk management.
- Conduct structured aviation accident and incident investigations using internationally recognized methodologies.
- Collect, preserve, validate, and analyze investigation evidence using systematic investigative techniques.
- Evaluate human factors, organizational influences, and technical failures contributing to aviation occurrences.
- Apply advanced Root Cause Analysis methodologies to identify immediate, contributing, and underlying causes.
- Utilize investigation tools including Five Whys, Fault Tree Analysis, Fishbone Diagrams, Event Sequencing, and Barrier Analysis.
- Develop effective corrective and preventive actions that eliminate root causes and reduce operational risk.
- Improve analytical thinking, critical reasoning, and structured decision-making during aviation investigations.
- Strengthen aviation safety reporting and professional investigation documentation skills.
- Promote organizational learning through effective dissemination of investigation findings and lessons learned.
- Develop leadership competencies that strengthen aviation safety culture and employee engagement.
- Apply international risk management principles to improve organizational resilience and operational continuity.
- Lead safety improvement initiatives that support regulatory compliance, continuous improvement, and long-term aviation safety excellence.

Course Outlines

ay 1: Accident & Incident Causation Factors

- Accident analysis: Looking at the facts, figures, and costs.
- Why do accidents still occur? - Human factors, triggers, and consequences.
- Conscious and unconscious influences within a safety culture.
- The Bradley Curve and Four Stages of Mindsets.
- The New ABC Model: Effective, Behavioral, and Cognitive Psychology.
- Understand the psychology behind human behavior and how to apply practical solutions to improve your Safety Management System SMS.

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A graphic of a chessboard with several chess pieces (king, queen, rook, knight, and pawns) in gold and silver, set against a background of concentric circles.

Day 2: Safety Management in Major Hazard Industries

- Major hazards and their prevention.
- ISO31000 and achieving Safety Excellence.
- Occupational safety, process safety, and asset risk management.
- FTA and ETA.
- Bow Ties methodology.
- Emergency response plans, mutual aid, and on/off-site consequences.
- Inspection and auditing procedures.

Day 3: Improve Leadership and Communication Skills

- Enhance your leadership capabilities through increased self-awareness.
- Analyze your communication strategies and social performance.
- Communication campaigns and stakeholder engagement.
- Creating real desire for safety: "Have to" vs. "Want to".
- Adapting leadership skills to varying situations and challenges.

Day 4: Advanced Accident Investigation and Reporting

- Investigating all incidents including near misses with a trained, confident team.
- The role of the HSE Team Leader and management during an investigation.
- Investigation methodology: Essential checklists and processes.
- Learn to listen, look, and observe more effectively.
- Report writing techniques that persuade and empower action.

Day 5: Organizational & Environmental Risk, Threat, & Impact

- Latest international standards: BSI65000, BS11200, ISO31000, 22301, and 24762.
- Understanding the impact of changes or major incidents on the organization.
- Strategic crisis and emergency management within a resilience framework.
- Strategic risk and risk behavior analysis.
- Identifying and managing current and future threats to your business.
- Taking a proactive approach to minimize the impact of incidents.
- Keeping critical functions operational during crises and change.

Day 6: 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.

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Day 7: 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 8: 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 9: 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 10: 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.

Day 11: Aviation Safety Foundations

- The importance of aviation safety in global operations.
- ICAO safety standards: Annex 13 Accident Investigation and Annex 19 Safety Management Systems.
- Components of Safety Management Systems SMS: policy, risk, assurance, and promotion.
- Case study: analyzing lessons learned from a major aviation accident.

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Day 12: Human and Organizational Factors in Safety

- The role of human performance in incidents and accidents.
- SHELL model and Swiss Cheese Theory.
- Teamwork, communication, and fatigue management in aviation operations.
- Workshop: evaluating human factors in flight and maintenance scenarios.

Day 13: Accident Investigation Process and Techniques

- Legal basis, objectives, and scope of accident investigation.
- Investigation steps: notification, on-site evidence collection, analysis, and reporting.
- Data collection tools: interviews, photographs, flight data recorders FDR/CVR, and documentation.
- Simulation: conducting an on-site accident investigation and reviewing evidence.

Day 14: Analysis, Root Cause Identification, and Reporting

- Techniques for identifying immediate and root causes.
- Analytical tools: Fault Tree Analysis FTA and 5 Whys method.
- Structuring factual and analytical investigation reports.
- Practical exercise: drafting and presenting a mock investigation report.

Day 15: Safety Culture and Continuous Improvement

- The role of leadership in building and sustaining a safety culture.
- Promoting a “Just Culture” and effective safety reporting systems.
- Integrating investigation findings into operational training and risk management.
- Action planning: developing a post-course aviation safety improvement roadmap.

Why Attend This Course: Wins & Losses!

- Develop comprehensive expertise across aviation safety management, accident investigation, root cause analysis, and safety leadership within a single integrated program.
- Gain practical experience conducting aviation accident and incident investigations using internationally recognized investigative methodologies.
- Strengthen analytical capabilities by applying structured Root Cause Analysis techniques to complex aviation operational challenges.
- Improve the ability to identify technical, organizational, environmental, and human factors contributing to aviation occurrences.
- Build confidence in developing corrective and preventive actions that address the true causes of operational failures.
- Enhance understanding of Safety Management Systems SMS and their integration with investigation and risk management processes.
- Strengthen leadership skills required to build proactive safety cultures and improve organizational safety performance.
- Improve decision-making capabilities through data-driven investigation techniques and structured analytical frameworks.
- Learn how to manage safety risks proactively while supporting regulatory compliance and operational resilience.
- Increase the effectiveness of safety reporting, investigation documentation, and communication with regulators and stakeholders.
- Develop practical strategies for organizational learning, continuous improvement, and knowledge sharing following safety events.
- Enhance professional capability to support safer aviation operations, reduce repeat occurrences, and improve long-term operational reliability.

Conclusion

The Advanced Aviation Safety, Accident Investigation, Root Cause Analysis & Safety Leadership program provides a complete framework for understanding, investigating, analyzing, and preventing aviation safety events through the integration of internationally recognized safety management principles, structured investigation methodologies, advanced analytical techniques, and modern leadership practices. By combining three complementary disciplines into one comprehensive learning experience, the program enables participants to develop the technical expertise and leadership capabilities required to improve aviation safety performance across operational, maintenance, engineering, and management environments.

Throughout the fifteen-day program, participants strengthen their competencies in aviation safety management, accident investigation, evidence collection, human factors analysis, root cause analysis, corrective and preventive action development, safety reporting, risk management, organizational resilience, crisis management, and safety leadership. Extensive case studies, practical investigation exercises, workshops, and realistic aviation simulations ensure that participants can confidently apply the knowledge gained to real operational situations.

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The program also emphasizes the importance of building sustainable safety cultures, promoting organizational learning, strengthening regulatory compliance, and integrating investigation findings into continuous improvement initiatives. Participants learn how effective leadership, systematic investigations, structured analytical methods, and proactive safety management work together to reduce operational risk, prevent recurring incidents, improve organizational performance, and support long-term aviation safety excellence.

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A graphic illustration of a chessboard with a checkered pattern. Three chess pieces are visible: a gold king, a silver pawn, and a gold pawn. The pieces are positioned on the board, with the gold king being the largest and most prominent. The background features a series of concentric, light gray circles that create a sense of depth and focus on the pieces.