

Day 1: 6 Hours of Instruction, 1 Hour Review

Case Study 1 Discussion (1 hour): The trainee reviews NTSB Aviation Accident Report 1401, Asiana Flight 214, and discusses the human, organizational, technical, and environmental factors related to the accident. This discussion provides the starting point for considering “what-if” Safety Report #1, where a flight crew in their organization reported a similar occurrence but resulted in a near miss (go around that barely missed the sea wall) instead of an accident. It explores how the hazards would be identified and the associated risks managed.

Safety Risk Management Principles (1 hour): This module covers the concept of safety, challenging conventional methods with progressive thinking about accident causation which focuses on the organization’s decisions that lead to latent conditions. It addresses human error and deviation, while addressing defenses that can be put in place to prevent an incident.

Safety Risk Management Process (1 hour): The module describes the safety risk management process to include: Hazard identification, consequences, risk analysis, risk assessment, risk tolerability, and developing mitigation. It addresses the value of stakeholders and effective control implementation. Hazard risk registers are presented with tips on how best to utilize them to track and monitor risk management, brief the accountable executive, ensure the organization stays on track to achieve its goals.

Bowtie Method (1 hour): This module covers the origins of the Bowtie technique. It provides insight into the framework of threats, consequences, escalation factors, and barriers. This highly visual model allows the user to see one complete picture of how to mitigate risk by affecting both probability (barriers to threats) and severity (barriers to consequences). The trainee applies the model to basic aviation risks related to consequences such as CFIT, LOC-I, and fatigue.

Run an Effective Safety Meeting (1 hour): This module covers the essential and universal elements of managing productive meetings. It highlights the importance of earning the reputation of being a skilled meeting facilitator. Ten fundamental tips are presented that enable the trainee to apply immediately in their organization. All aspects are covered from meeting planning, conducting the meeting, and post-meeting follow-up activities.

Just Safety Policy (1 hour): This module explores the reasoning behind a just culture and provides insight into to practical ways to apply this philosophy both in writing (i.e. policy) and in actual organizational behavior (culture). The trainee learns about policy’s role in preventing an “organizational accident” and reviews the algorithm for just culture decision-making after an employee deviation from policy that results in an incident. The module also provides ICAO’s perspective on just culture and the purpose of a safety policy statement from the accountable executive.

Review and Discussion (1 hour): The trainees are invited to discuss the lessons learned from this day’s modules and relate them to the case study (NTSB AAR 1401), as well as to the fictional safety report (“what-if” Safety Report #1). A 10-question quiz is completed which covers the day’s lessons and homework is assigned (NTSB AAR 1402) which will be discussed in the beginning of Day 2.

Day 2: 6 Hours of Instruction, 1 Hour Review

Case Study 2 Discussion (1 hour): The trainee reviews NTSB Aviation Accident Report 1402, UPS Flight 1354, and discusses the human, organizational, technical, and environmental factors related to the accident. This discussion provides the starting point for considering “what-if” Safety Report #2, where a flight crew in their organization reported a similar occurrence but resulted in a near miss (go around that barely missed the hitting the trees) instead of an accident. It explores how the hazards would be identified and the associated risks managed.

Managing Human Factors (1 hour): This module presents the philosophy of how unmanaged human factors can lead to accidents. It examines the SHELL model to provide insight into the potential effects of human interaction with software, hardware, environment, and other people. The 5-M approach to accident prevention is explored to include psychological and cognitive factors considered and studied at the US Air Force Safety Center. Practical applications for safety performance indicators and targets are presented and discussed. ICAO tools are provided to the trainees with demonstration on how they work.

Root Cause Analysis (1 hour): This module explores the various techniques of root cause analysis, to include the US Department of Energy Root Cause Analysis Guidebook. The techniques presented and discussed include: Events and Causal Factor Analysis (ECFA), Change Analysis, Barrier Analysis, 5-Whys, and the Ishikawa Fish Bone Diagram utilizing 8-Ms. Practical examples are provided and discussed, to include a Fishbone example related to a runway excursion.

Incident Investigation (1 hour): This module explores the purpose and how to investigate following an incident. It examines an OSHA incident/accident investigation guide book and covers the essential elements to include: evidence collection, interviewing witnesses and involved employees, determining and examining contributing factors. Boeing investigation techniques are presented and discussed (MEDA, REDA, PEAT, CPIT). This provides the trainee with an understanding of the interplay between errors, deviations, and causal factors.

Occupational Health and Safety (OHS) (1 hour): This enlightening module presents the need for OHS, i.e. around the world, a person is killed on the job every 15 seconds. The trainee learns about OSHA requirements, both from the employer and employee perspective. Typical OHS Hazards in the Workplace are reviewed, along with the Top 10 OSHA standards violated in FY2016. Finally, the difference is clarified between OHS versus SMS focus, with the idea that a common Hazard – Risk Registry can serve both purposes.

Safety Training Plan (1 hour): This module highlights the role of training in preventing accidents and incidents. Techniques are explored to develop a training plan by reverse engineering the accident causation model by Dr. James Reason. ICAO guidance is presented and discussed with focus on hazard taxonomy and how this can assist the safety leader in developing a strategic approach to training. A training gap analysis tool is presented and shared with each attendee that they can apply in their own organization.

Review and Discussion (1 hour): The trainees are invited to discuss the lessons learned from this day’s modules and relate them to the case study (NTSB AAR 1402), as well as to the fictional safety report (“what-if” Safety Report #2). A 10-question quiz is completed which covers the day’s lessons and homework is assigned (NTSB AAR 1701) which will be discussed in the beginning of Day 3.

Day 3: 6 Hours of Instruction, 1 Hour Review

Case Study 3 Discussion (1 hour): The trainee reviews NTSB Aviation Accident Report 1701, Helicopter Crash on Takeoff N390LG, and discusses the human, organizational, technical, and environmental factors related to the accident. This discussion provides the starting point for considering “what-if” Safety Report #3, where a flight crew in their organization reported a similar occurrence but resulted in a near miss (hover check that revealed a serious problem and a resulting firm landing on abort) instead of an accident. It explores how the hazards would be identified and the associated risks managed.

Audit Principles (1 hour): During this module, the trainee reviews key audit terms and principles based on ISO 19011, *Guidelines for Auditing Management Systems* and IS-BAO. The trainee discusses the values of integrity, fairness, confidentiality, independence, and evidence-based conclusions. Population sampling is discussed, along with the principles of audit scope and objectives. The trainee is presented with various audit criteria which can be applied to a wide variety of organizations, each one having a focus on safety risk management.

Audit Process (1 hour): The six steps of the audit process are presented and discussed to include: initiating, preparing, conducting, audit report preparation, completion, and follow-up. Each step is broken down into its elements so the trainee can appreciate the amount of work involved in conducting internal or external audits. The module presents an example of industry tools utilized to conduct safety audits to include the ICAO, FSF, IBAC and FAA.

Evidence Gathering Techniques (1 hour): This module presents and the trainee discusses the primary ways an auditor collects evidence. Interviewing techniques are explored to include salient points from ISO 19011. Other techniques are provided related to observations and document reviews. The trainee practices interviewing an employee that was involved in an incident and uses this information to consider contributing factors and latent threats.

Preparing Findings (1 hour): This module presents and the trainee discusses how to make findings based on the audit criteria, audit objectives, and collected evidence. The difference between compliance and conformity is explored, along with the proper use of auditor recommendations, when there is a gap based on criteria that are other than standards or regulatory requirements. Example finding statements are presented, along with the technique of determining finding criticality to enhance the process to develop a corrective action plan.

Emergency Response Plan (ERP) (1 hour): This module provides insight into ERP requirement from an ICAO perspective. References cited include ICAO Annex 19 to the Chicago Convention, ICAO Document 9859, *Safety Management Manual*, and advisory information from national authorities. Focus is placed on the objective of an ERP, as well as recommended contents for post-accident considerations. How to manage the media is presented and discussed, as well as ideas regarding family assistance. Conformity checklists are presented and reviewed.

Review and Discussion (1 hour): The trainees are invited to discuss the lessons learned from this day’s modules and relate them to the case study (NTSB AAR 1701), as well as to the fictional safety report (“what-if” Safety Report #3). A 10-question quiz is completed which covers the day’s lessons and homework is assigned (NTSB AAR 1302) which will be discussed in the beginning of Day 4.

Day 4: 6 Hours of Instruction, 1 Hour Review

Case Study 4 Discussion (1 hour): The trainee reviews NTSB Aviation Accident Report 1302, Helicopter N352LN fuel exhaustion, and discusses the human, organizational, technical, and environmental factors related to the accident. This discussion provides the starting point for considering “what-if” Safety Report #4, where a flight crew in their organization reported a similar occurrence but resulted in a near miss (autorotation after engine failure and a resulting firm landing) instead of an accident. It explores how the hazards would be identified and the associated risks managed.

Organizational Culture (1 hour): This module explores the relationship between SMS performance and organizational culture. Trainees learn about the characteristics of a safety culture and how that relates to an organization’s overall culture. Key attributes of a safety culture are presented and discussed to include: reporting, informed, just, flexible, and learning. Scholarly research is cited which describes the correlation between trust, information, and incident rates. Finally, the trainee is presented with a variety of ways to assess the culture of their organization.

Management Versus Leadership (1 hour): This fascinating module explores the differences between the concepts of management and leadership. As both sides of one coin are considered, the trainee is reminded that successful leaders must manage and successful managers must lead. This training is a clear and refreshing reminder that anyone can be a leader and leadership is not just for those who hold higher titles. Finally, the four pillars of the SMS are studied which clarifies which components require leadership and which require effective management.

Safety Assurance and Quality (1 hour): This module explores the concepts related to Safety Performance Indicators (SPIs), targets, and internal evaluation programs (IEPs) utilizing quality principles to include employee surveys and performance monitoring with safety performance indicators and targets. The trainee is challenged to consider a fundamental reason for having an IEP, i.e. preventing an incident. With this as a starting point, the trainee learns how to design an effective IEP by considering killer items and human factors.

Business of Safety (1 hour): This module explores how to manage a safety program like any other business, with values and principles that are universal and timeless. The trainee learns about Fayol’s 14 business management principles and how they can be applied to safety risk management. By the end of the lesson, the trainee will have considered and discussed the value of balancing production and safety effectively to improve operational capability.

Organizational Change Management (1 hour): This module presents change events that should be managed formally within the SMS. The trainee learns the essential steps in managing change to effectively identify threats and associated consequences. Practical examples are provided to analyze risk and mitigate the risk level to as low as reasonably practical. ICAO and national authority advisory guidance is utilized to make the case for the change management and tools are presented to assess the effectiveness of the change management element of the SMS. Also, each trainee is provided a tool to practically manage significant change in their organization.

Review and Discussion (1 hour): The trainees are invited to discuss the lessons learned from this day’s modules and relate them to the case study (NTSB AAR 1302), as well as to the fictional safety report (“what-if” Safety Report #4). A final exam is completed which covers the all lessons over the 4-day event.