



SMS Training for Investigators

Syllabus

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SMS Training for Investigators (5 days)

Comprehensive competence.

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1 Day 1

1.1 Module INV01: Make Safety a System

Note: Presentation of generic SMS risk management process and safety culture definition, may be adapted to customer specific process and definition on request

| Objectives | Contents of Module | Practical Training/Discussion |
|--|---|--|
| <p>Objective 1: Understand the context and drivers of a Safety Management System</p> <p>Objective 2: Differentiate existing safety management organization and new elements of a SMS</p> | <p>1. Framework:</p> <ul style="list-style-type: none"> • Definition of Safety, Risk and Risk Assessment • Concept of a Safety Management System • SMS Risk Management Process • Key processes of an SMS | <p>Group discussion on “what is safety, risk and risk assessment?”</p> |
| | <p>2. Requirements:</p> <ul style="list-style-type: none"> • ICAO Standards and Reference Documents • SMS Definition | |
| | <p>3. Orientation:</p> <ul style="list-style-type: none"> • Accident Prevention Program (AAP) • Reactive, proactive and predictive Safety Measures | |

| 1.2 Module INV02: SMS Background | | |
|--|--|---|
| Objectives | Contents of Module | Practical Training/Discussion |
| <p>Objective 3: Understand the relationship between a State safety program (SSP) and an SMS</p> <p>Objective 4: Be able to describe SMS requirements: ICAO Document 9859 and Annexes</p> <p>Objective 5: Be able to describe EASA Ops SMS requirements</p> | <p>1. ICAO Safety Management SARPs:</p> <ul style="list-style-type: none"> • ICAO Safety Management SARPs framework • SMS safety performance measurement and indicators • Development of SSP • Relationship SSP-SMS | <p>Exercise: An Airline wants to implement an SMS</p> |
| | <p>2. State Safety Program</p> <ul style="list-style-type: none"> • SMS as integral part of SSP • Differences and Relationship between SSP and SMS | |
| | <p>2. ICAO SMS Components</p> <ul style="list-style-type: none"> • The base of SMS • The ICAO components of SMS | <p>Practical examples</p> |
| | <p>3. EASA SMS Regulations:</p> <ul style="list-style-type: none"> • Implementation rules (IRs) • Accepted means of compliance (AMCs) • Guidance material (GM) | |

| 1.3 Module INV03: Setting Up an SMS | | |
|---|---|--|
| Objectives | Contents of Module | Practical Training/Discussion |
| Objective 6: Be able to develop a system description Objective 7: Prepare and perform a gap analysis | 1. Costs and Benefits: <ul style="list-style-type: none"> • General Considerations • Costs of a Safety Management System • Benefits of a Safety Management System | Identify and discuss the core traits for an effective safety reporting system in your organization |
| Objective 8: Know how to develop an implementation plan Objective 9: SMS documentation requirements | 2. System Description: <ul style="list-style-type: none"> • ICAO requirements for a system description • System description for an airline operators | Start working on a system description |
| Objective 10: Setting up an SMS documentation Objective 11: SMS documentation in daily practice | 3. Gap Analysis: <ul style="list-style-type: none"> • Gap analysis requirements • Gap analysis check list • How to perform a gap analysis | Group work on a gap analysis checklist example |
| | 4. Implementation Plan: <ul style="list-style-type: none"> • Use of an implementation plan • The ICAO phased approach to an SMS • Resource planning • Authority approval | First steps towards an implementation in your organization |
| | 5. SMS Documentation: <ul style="list-style-type: none"> • System Processes and Operating Procedures • Documentation Layout • Organization Safety Management Manual | Examination of existing operational and quality manuals |

1.4 Module INV04: SMS Integration

Note: Presentation of a generic SMS implementation and risk assessment tools (safety risk evaluation, safety review, event risk classification), may be adapted to customer specific implementation and tools on request

| Objectives | Contents of module | Practical Training/Discussion |
|--|--|---|
| Objective 12: Understand the structure of the Safety Review Board Objective 13: Distinguish between different risk assessment tools | 1. Integration of an SMS: <ul style="list-style-type: none"> • Integration according to the Definition | Discussion on “Organizational impact of SMS implementation” |
| | 2. Organizational Structures: <ul style="list-style-type: none"> • SMS as Part of the Management System | |
| | 3. Accountabilities: <ul style="list-style-type: none"> • Safety Review Board (SRB) • Safety Action Group (SAG) • Safety Service Office (SSO) • Senior Management | |
| | 4. Policies: <ul style="list-style-type: none"> • Safety Policy Requirements • Safety Policy Guidance Material | |
| | 5. SMS Processes and Management Change: <ul style="list-style-type: none"> • Processes required for an SMS • Processes of Systematic Risk Assessment • Requirements for Management of Change | |

2 Day 2

| 2.1 Module INV05: Safety Culture and Reporting | | |
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| Objectives | Contents of Module | Practical Training/Discussion |
| Objective 14: Define Safety Culture Objective 15: Learn how to assess and improve safety culture Objective 16: Improve reporting culture | 1. Safety Culture: <ul style="list-style-type: none"> • Definition of Safety Culture • Characteristics of Safety Culture | Group discussion on “How to establish/improve safety culture?” |
| | 2. Just Culture: <ul style="list-style-type: none"> • Definition • The way of Safety Thinking • Just Safety Culture Elements • Types of Unsafe Behavior | |
| | Measuring Safety Culture: <ul style="list-style-type: none"> • Maturity Levels • Safety Culture Indicator Scale | |
| | 2. Reporting Culture: <ul style="list-style-type: none"> • Incentives • Reporting culture • Strategies to improve reporting rates | Group discussion on “reporting - where is the limit?” |

| 2.2 Module INV06: Safety Assurance and Safety Performance Indicators (SPIs) | | |
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| Objectives | Contents of Module | Practical Training/Discussion |
| Objective 17: Understand Safety Assurance Objective 18: Develop and Review SPIs | 1. Safety Assurance: <ul style="list-style-type: none"> • Safety surveys • Methods to detect changes in functional systems or operations • Use of safety records | Apply methods for management of change |
| | 2. Safety Performance Monitoring and Measurement: <ul style="list-style-type: none"> • Definitions • Possible Types of Measurements • SMS Process and SPI Observation • SPI Implementation Strategy | Define a set of SPIs |
| | 3. SPIs and SMS Reporting <ul style="list-style-type: none"> • SPIs at Work | Group Discussion on SPIs |
| | 4. Continuous Improvement of the SMS: <ul style="list-style-type: none"> • Safety Performance Targets • Action Plans | |

2.3 Module INV07: Compliance based Oversight to Performance based Oversight

| Objectives | Contents of Module | Practical Training/Discussion |
|---|---|-------------------------------|
| <p>Objective 19: How to measure safety performance</p> <p>Objective 20: Get familiar with the differences of compliance based and performance based oversight</p> | <ul style="list-style-type: none"> • Measuring Safety Performance • Prescriptive Rules and Compliance Based Oversight • Performance Based Rules and Performance Based Oversight • Enablers of Performance Based Environment | |

2.4 Module INV08: Emergency Response Preparedness

Note: May be adapted to customer specific ERP on request

| Objectives | Contents of Module | Practical Training/Discussion |
|--|---|-------------------------------|
| Objective 21: Get to know your emergency response plan | 1. Role of SMS during an Emergency <ul style="list-style-type: none"> • ICAO requirements • Components of an ERP | |
| Objective 22: Become familiar with the duties and responsibilities in regards to the ERP | 2. Duties and Responsibilities <ul style="list-style-type: none"> • Duties and Responsibilities of the ERP Team and the Support Members • Typical Structure of the ERP Manual | |
| Objective 23: Get to know who conducts an accident investigation and who shall participate | 3. Organization of an Emergency Response Plan (ERP) <ul style="list-style-type: none"> • Transition • Coordination • Typical Coordination Procedures • Areas to be Considered for coordination | Case study: Major accident |
| | 4. ERP Elements <ul style="list-style-type: none"> • Information to the Authorities • Internal Communication • Information to the External Entities • Dealing with the Media • Typical Outsourced Tasks | |
| | 5. Accident Investigation <ul style="list-style-type: none"> • Who is conducting the investigation • Who participates • Access to the information • Elements of an Investigation • Format of the Final Report | |

3 Day 3

| 3.1 Module INV09: Introduction to Measurement | | |
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| Objectives | Contents of Module | Practical Training/Discussion |
| Objective 24: Learn how to measure anything and why | <ul style="list-style-type: none"> • Ways of measurement • Reasons for measurement | Exercise: Fermi Questions |

| 3.2 Module INV10: Modeling Risk | | |
|--|--|---|
| Objectives | Contents of module | Practical Training/Discussion |
| Objective 25: Distinguish between Threat, Hazard and Consequence | 1. Hazard Identification: <ul style="list-style-type: none"> • Definition of Threats, Hazards and Consequences • Documentation of Hazards | Group Activity “what is a threat, hazard, consequence?” (Flipchart) |
| Objective 26: Show methods and tools for Hazard Identification | 2. Bow Tie Model: <ul style="list-style-type: none"> • Development of Bow Tie Model | Group Activity “develop bow tie model for specific risk” |
| Objective 27: Develop a Bow Tie Model in the group | | |

| 3.3 Module INV11: Bow Tie Case Study | | |
|---|--|--|
| Objectives | Contents of module | Practical Training/Discussion |
| Objective 28: Get practical experience with the Bow Tie Model | 1. Hazard Identification: <ul style="list-style-type: none"> Select the correct hazard | Small groups develop bow tie model on flip chart |
| | 2. Threats and Consequences: <ul style="list-style-type: none"> Determine threats and consequences for the hazard | Work with flipchart in small groups |
| | 3. Defenses and Barriers: <ul style="list-style-type: none"> Find defenses and barriers to mitigate the risk effectively | |
| | 4. Result of Group Work: <ul style="list-style-type: none"> Groups present result of their work to other groups | Presentation of results |

4 Day 4

4.1 Module INV12: Safety Risk Management

Note: Presentation of a generic risk matrix, probability and severity table, may be adapted to customer specific matrix and tables on request

| Objectives | Contents of Module | Practical Training/Discussion |
|---|--|---|
| Objective 29: Show methods and tools for Safety Risk Assessment | 1. Risk Assessment: <ul style="list-style-type: none"> • Definition of Risk Severity and Risk Probability • Handling of Risk Severity and Risk Probability tables • Introduction of Risk Index and Risk Matrix | Group discussion on severity and probability |
| | 2. Risk Mitigation: <ul style="list-style-type: none"> • Four Strategies for Risk Mitigations | Practical examples for risk mitigation strategies |
| | 3. Safety Risk Assessment Tools <ul style="list-style-type: none"> • Triggers and Examples for Safety Risk Assessments | |
| | 4. Risk Management Process: <ul style="list-style-type: none"> • Schemata of Risk Management Process | |

4.2 Module INV13: Extended Event Risk Classification (EERC) for Safety Reports

Notes: Based on “Event Risk Classification” provided by EASA ARMS working group may be adapted to customer specific reporting risk assessment procedure on request. Use of generic examples, may be adapted to customer specific examples on request

| Objectives | Contents of Module | Practical Training/Discussion |
|--|---|---|
| Objective 30: Learn how to make a systematic event risk classification | 1. Extended Event Risk Classification theory: <ul style="list-style-type: none"> EERC process EERC usage | Group discussion on “time needed/available for report risk assessment?” |
| | 2. Extended Event Risk Classification practice <ul style="list-style-type: none"> Use of matrix Use of results | Group assesses different example reports |

4.3 Module INV14: Safety Risk Evaluation (SRE)

Notes: Based on “Safety Issue Risk Assessment” provided by EASA ARMS working group, may be adapted to customer specific implementation on request. Use of generic risk evaluation document template and example, may be adapted to customer specific template and example on request

| Objectives | Contents of Module | Practical Training/Discussion |
|--|--|--|
| Objective 31: Understand the concept of a Safety Risk Evaluation (SRE) | 1. Motivation for safety risk evaluation <ul style="list-style-type: none"> Risk assessment example case study | Group discussion about the pitfalls of the performed risk assessment |
| Objective 32: Ability to use the Safety Risk Evaluation Document | 2. Safety Risk Evaluation (SRE): <ul style="list-style-type: none"> When to perform a safety risk evaluation Usage of results | Group discussion of triggers of safety risk evaluation by means of example |
| | 3. Safety Risk Evaluation Document: <ul style="list-style-type: none"> Introduction how to handle the safety risk assessment document Example for specific already filled out safety risk evaluation document | |

| 4.1 Module INV15: SRE Case Study | | |
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| Objectives | Contents of module | Practical Training/Discussion |
| Objective 33: Perform a Safety Risk Evaluation and get practical experience Objective 34: Get to know a ready to use and practical risk assessment tool | 1. Use the SRE Template: <ul style="list-style-type: none"> • Fill out the SRE document | Small groups develop SRE using the laptop |
| | 2. Develop Bow Tie Model for SRE: <ul style="list-style-type: none"> • Determine hazard, threats and consequences for the hazard | Work with laptop in small groups |
| | 3. Assess the Risk: <ul style="list-style-type: none"> • Make risk assessment using your new skills | |
| | 4. Defenses and Barriers: <ul style="list-style-type: none"> • Find defenses and barriers to mitigate the risk effectively | |
| | 5. Result of Group Work: <ul style="list-style-type: none"> • Groups present result of their work to other groups | Presentation of results using the document on the laptop |

5 Day 5

| 5.1 Module INV16: Assessing the Effectiveness of an SMS | | |
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| Objectives | Contents of Module | Practical Training/Discussion |
| Objective 35: Assessing gaps for an SMS | <ul style="list-style-type: none"> • How do we measure risk? • Stratification Methods • Calculus of Preferences and Probabilistic Models • The limits of Expert Knowledge • “Law of Small Numbers” • Causes and Consequences of Overconfidence • Presumption of regular intervals and independence • Preference Axioms | |

| 5.2 Module INV17: Safety Management System Investigations | | |
|---|---|--------------------------------------|
| Objectives | Contents of Module | Practical Training/Discussion |
| Objective 36: Get to know the expected outputs of an SMS | 1. How to Audit an SMS under ICAO: <ul style="list-style-type: none"> • ICAO Components of SMS • UK CAA SMS Evaluation Tool • Auditing Safety Culture • Best Practice and Lessons Learned | |
| Objective 37: Be able to differentiate between a compliant and an effective SMS | 2. How to Audit an SMS under EASA <ul style="list-style-type: none"> • EASA Regulation • MS.ORO.GEN.200 Compliance • SMS Documentation • Compliance Monitoring vs. Safety Management • Auditing Effectiveness | |

| 5.1 Module INV18: Introduction to Resilience Engineering | | |
|---|--|--------------------------------------|
| Objectives | Contents of Module | Practical Training/Discussion |
| Objective 38: Get an overview about Resilience Engineering | <ul style="list-style-type: none"> • Three ages of industrial safety • Safety culture and organisational failures • Safety as elimination of failures • Being safe versus being unsafe • Premises of Resilience Engineering | |