

Technical Guidance Material on Safety Management System Training Syllabus Advisory Circular

SUBJECT: AVIATION SAFETY MANAGEMENT SYSTEM TRAINING

EFFECTIVE DATE: 22 NOVEMBER 2016

1. APPLICABILITY

To all aviation training organizations

2. PURPOSE OF THIS GUIDANCE MATERIAL

This guidance material serves to provide the minimum criteria for the establishment of a SMS course for the training of aviation safety personnel as required by CAR Part 140 in order to enable safety personnel to implement and maintain a Safety Management System.

3. REGULATORY REFERENCE

The issuance of this guidance material is necessitated by the following Regulations and Technical Standard which relates to the implementation of safety management system:

CAR Part 140 – Safety Management System
CATS-140 – Safety Management Systems

4. INTRODUCTION

A SMS is a systematic approach to managing safety, including the necessary organizational structure, accountabilities, policies and processes. In order to reinforce the notion of safety management being a managerial process, the new ICAO safety management requirements include provisions for an organization to establish lines of safety accountability throughout the organisation, as well as at senior management level. The requirements impose upon States the responsibility to establish a safety program and, as part of such a program, require that air operators, maintenance organizations, air traffic service providers, design and manufacturing organisations and aerodrome operators implement a safety management system (SMS).

The SACAA is obliged to ensure that minimum standards for Aviation SMS training are established in order to ensure consistency and credibility to SMS training programs.

Information contained in this document sets the basis for the training content of safety management training courses. This document sets out the criteria for the development of a SMS training course for Safety Management Personnel. These are the persons who are, or will be, responsible for the implementation and maintenance of Safety Management System (“SMS”), within the context of the CAR Part 140 and associated CATs document.

The SMS training criteria contained in this document is intended to provide the training organisation with the core training components necessary to establish a course on safety management system training. The person who successfully completes this SMS training will be expected to have the necessary knowledge, skills and aptitude to implement and maintain a safety management system as is required by CARs Part 140.

The criteria should not be seen as limiting further expansion of the training course beyond these minimum recommended components.

5. OVERVIEW

A training course for Safety Management Personnel (“the Course”) should be developed and presented at a level to teach the Safety personnel how to design, implement and maintain a SMS.

With an insight of the job skills required of modern-day aviation safety person the following is proposed as a training basis for the minimum standard of aviation safety personnel. The basis of this proposed safety management course is ICAO Doc 9859 Safety Management Manual (SMM) third Edition.

6. AIM OF THE TRAINING COURSE

The aim of the Aviation Safety Management System training course is to provide the student with the necessary knowledge, skills and aptitude in developing, implementing and managing a Safety Management System, as well as measuring its performance in a medium to large aviation company.

7. COURSE GOALS

The goals of the Safety Management Systems (SMS) Course are to:

- a. Develop the student’s knowledge of safety management concepts and ICAO Standards and Recommended Practices (SARPs) on Safety Management as per ICAO Annex 19 and ICAO Doc 9859.
- b. Develop the student’s knowledge to oversee the implementation of the key components of a basic SMS, in compliance with the CARs Part 140.

The SMS Course should address the following four general requirements of SMS:

- a. Safety policy and objectives.
- b. Safety risk management.
- c. Safety assurance.
- d. Safety promotion.

8. COURSE CONTENT

The Training Course should address the following seven modules. Each module should be taught as a separate unit of study with reference to the overview above. However, it is important that Safety personnel learn how each module works in conjunction with every other module. Problem based (Case Study) learning is encouraged.

The method for training is not prescribed and is left to the discretion of the training organisation. The adequacy of the methodology used would however be audited by the SACAA during their certification and subsequent surveillance audits.

The following training reference material is required as a minimum, but any additional training reference material would be left to the discretion of the training organisation, to be approved by the SACAA.

9. TRAINING REFERENCE MATERIAL

Minimum required:

- a. ICAO Annex 19 (1st amendment)
- b. ICAO Doc 9859, third edition
- c. CAR 140,
- d. CATS Part 140

10. ASSESSMENT METHODS

Participants should be assessed by a combination of the following:

- a. Knowledge based questions
- b. Problem based questions
- c. Practical exercises

11. PASS MARK

Minimum pass mark of 70 % must be attained by all participants.

12. COURSE DURATION

Training must be over 5 days at a minimum or 40hours.

13. INSTRUCTOR REQUIREMENTS

A person presenting SMS training must have relevant experience which at a minimum includes:

- a. Basic and advanced SMS course
- b. Train the trainer course
- c. Lesson planning experience
- d. Presentation skills

MODULE ONE – Safety Management Fundamentals

Module Rationale

This module will provide participants with knowledge on fundamental safety management principles and concepts, including the influence of human as well as organizational factors in safety management.

| Sections | Topics to be covered | Minimum number of questions | Suggested SMM reference |
|--|---|-----------------------------|-------------------------|
| Section 1 – Concept of safety | Fundamental safety management concepts from the ICAO SMM (ICAO Doc 9859) | 1 | 2.1 |
| Section 2 – Evolution of safety | Evolution of safety thinking | 1 | 2.2 |
| Section 3 – Accident causation | Concept of accident causation | 2 | 2.3 |
| Section 4 – People, context and safety | SHEL(L) Model | 2 | 2.4 Fig 2-5 |
| Section 5 – Error and violation | Types of errors Error reduction strategies Violations | 3 | 2.5 |
| Section 6 – Safety culture | Organizational culture Professional culture Reporting culture Safety culture and organization risk profile Healthy safety culture | 4 | 2.6 |
| Section 7 – Management dilemma | Production and protection | 1 | 2.7 |

MODULE TWO – Hazard identification, safety risk management and safety reporting

Module Rationale

The purpose of this module is to familiarize participants with hazard identification concepts and safety reporting requirements.

| Sections | Topics to be covered | Minimum number of questions | Suggested SMM reference |
|---|--|-----------------------------|--|
| Section 1 – Safety reporting and investigation | Safety reporting systems Effective safety reporting characteristics Investigation of accidents and incidents Integration of safety investigation and HIRM process | 3 | 2.10 Fig 2-7 2.10.5 2.10.7 |
| Section 2 – Safety data collection and analysis | Safety data quality Safety data types Safety data analysis Analytical methods and tools Safety information systems requirements Considerations for protection of safety data Safety information indicators Purpose of safety data analysis and SPIs | 2 | 2.11.1 2.11.10 2.11.13 Fig 2-7 2.11.19 2.12.1 2.12 |
| Section 3 – Hazard Identification | Hazard identification Understanding hazards and consequences Hazards, threats and unsafe situations Hazard identification methodologies Difference between aviation and OHSE hazards Hazards management and documentation Hazard prioritization | 4 | 2.13.8 2.13.12 2.13.11 2.13.12 2.15.5 App 3 to Chap 2 |
| Section 4 - Safety Risk Mitigation | Safety risks Safety risk probability Safety risk severity Safety risk index Safety risk tolerability Safety risk management (ALARP) Risk mitigation and documentation Human factors and risk mitigation Risk mitigation and cost benefit analysis. | 4 | 2.14.2 2.14.3 2.14.7 Fig 2-13 2.14.9 Fig 2-14 2.15.5 2.15.6 2.17.7 |

MODULE THREE – Safety Management Standards and Recommended Practices (SARPs) – ICAO Annex 19

Module Rationale

The purpose of this module is to familiarize participants on Annex 19 SARPS on the State safety management responsibilities, including the implementation of the State Safety Program and the requirement for service providers to implement a SMS.

| Sections | Topics to be covered | Minimum number of questions | Suggested SMM reference |
|---|--|------------------------------------|--|
| Section 1 – state safety management responsibilities | State safety management responsibilities (SSP) Acceptable level of safety performance (ALoSP) SMS requirements for service providers SMS requirements for international general aviation | 1 | 3.2 4.3.5.1 4.2.19 Annex 19 |
| Section 2 – SSP framework | SSP components and elements State safety policy and objectives State safety risk management State safety assurance State safety promotion | 4 | 4.2 4.2.3 4.2.16 4.2.24 4.2.38 |
| Section 3 – SMS Framework | SMS regulatory framework Safety policy and objectives Safety policy and accountabilities Appointment of key safety personnel Coordination of emergency response planning SMS documentation Safety risk management Hazard identification Safety risk assessment and mitigation Safety assurance Safety performance monitoring and measurement Management of change Continuous improvement of SMS Safety promotion Training and education Safety communication SMS acceptance and accountability | 4 | CAR Part 140 5.3 |
| Section 4 – Prescriptive and performance based requirements | Understanding risk based – performance based requirements Requirements for performance based requirements Baseline and equivalent level of safety Performance based monitoring and measurement Auditing performance based requirements | 3 | 2.16 2.16.5 2.16.6 2.16.7 2.16.8 |

MODULE FOUR – Safety Data

Module Rationale

The purpose of this module is to familiarize participants on safety data collection, analysis, exchange and safety data protection provisions.

| Sections | Topics to be covered | Minimum number of questions | Suggested SMM reference |
|---|---|-----------------------------|----------------------------|
| Section 1 – Safety data collection, analysis and exchange | Safety data collection Safety data analysis Safety data protection Safety information exchange | 3 | Annex 19 Att. (Amndt 1) |
| Section 2 –Guidance for safety information protection | Purpose of safety information protection General safety information protection principles Principles of protection Principles of exception Public disclosure Responsibility of the custodian of safety information Protection of recorded information | 2 | Annex 19 Att. (Amndt 1) |
| Section 3 –Integration of management systems | Management systems Benefits of integration SMS and QMS integration | 2 | 5.4.2 |

MODULE FIVE – SMS Implementation

Module Rationale.

The purpose of this module is to provide the participant with the necessary knowledge and competency to implement and administrate a Safety Management System (SMS)

| Sections | Topics to be covered | Minimum number of questions | Suggested SMM reference |
|---|--|-----------------------------|-------------------------|
| Section 1 – SMS Organization and accountabilities | Identification of SMS accountable executive Appointment of project team and coordinator Definition of Terms of Reference for SMS Implementation team Establishment of SMS applicability/scope Establishment of safety management responsibilities and accountabilities Identification of SMS/Safety manager | 3 | SMS Element 1.2 |
| Section 2 – SMS gap analysis | Performance of SMS gap analysis Identification of action tasks Review organizational structure, safety accountabilities and procedures | 3 | Appendix 7 to Chapter 5 |
| Section 3 – SMS Implementation | Development of SMS implementation plan Verification of phased implementation Activation of phase 1/2/3/4 implementation tasks Monitoring of task implementation | 3 | Table 5-A7-2 |
| Section 4 – SMS Integration | Integration of SMS with QMS Integration of SMS with other relevant management systems Definition of external SMS interfaces | 3 | 5.4.2 |
| Section 5 – SMS manual and records | Development of SMS documentation Approval and agreement of SMS manual Initiation of SMS records keeping system | 3 | Appendix 4 to Chapter 5 |
| Section 6 – SMS Committee and Administration | Initiation of SMS/Safety committee Recommendation of SMS/safety committee schedule and agenda to SMS accountable executive Establishment of a permanent SMS administration function/office Initiation of Departmental Safety Action Groups where appropriate | 3 | 5.3.32-33 |
| Section 7 – Safety policy and objectives | Development of safety policy statement Development of safety objectives | 3 | SMS Component 1 |
| Section 8 – Emergency response planning | Initiation of organization's ERP Coordination of ERP with relevant external organizations | 3 | Appendix 3 to Chapter 5 |

MODULE SIX – SMS Implementation

Module Rationale.

The purpose of this module is to provide the participant with the necessary knowledge and competency to implement and administrate a Safety Management System (SMS)

| Sections | Topics to be covered | Minimum number of questions | Suggested SMM reference |
|--|---|-----------------------------|--|
| Section 1 – Hazard Identification and voluntary reporting system | Hazard identification from occurrence notification reports Hazard identification from occurrence investigation process Hazard identification from internal voluntary reporting systems Hazard identification from review of aviation equipment and processes Hazard identification during safety/quality surveillance processes Hazard identification from operational monitoring system data review Establishment of supplementary hazard survey programmes Establishment of central hazards register Establishment of hazard prioritization procedure | 3 | Appendix 2 to Chapter 2 Appendix 3 to Chapter 2 |
| Section 3 – safety risk mitigation | Establishment of risk mitigation procedure Establishment of safety risk mitigation documentation Definition of SRM approval processes | 3 | Appendix 2 to Chapter 2 |
| Section 4 – Management of change | Establishment of management of change procedures | 2 | 2.8 |
| Section 5 - Occurrence reporting and Investigation | Establishment of mandatory occurrence notification and investigation procedures Establishment of routine incident notification and investigation procedure Establishment of safety data administration policy/procedure | 3 | 2.10 |
| Section 6 – SMS disciplinary policy and procedures | Establishment of internal disciplinary policy and procedures Establishment of equitable disciplinary decision aid (just culture) | 3 | Appendix 11 to Chapter 4 |
| Section 7 – Safety data processing and analysis | Processing and analysis of safety data | 2 | 2.11 |

MODULE SEVEN – Safety Performance Indicators and Acceptable Level of Safety Performance Development

Module Rationale.

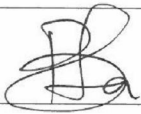
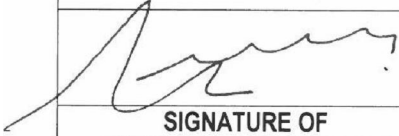


The purpose of this module is to provide the participant with knowledge on the following:

- Development of SPIs,
- Development of SPI charts,
- Target settings,
- Safety performance monitoring and
- Establishment and achievement of ALoSP.

| Sections | Topics to be covered | Minimum number of questions | Suggested SMM reference |
|---|--|-----------------------------|--|
| Section 1 – SMS safety performance | Identification of high consequence SPIs Development of high consequence SPIs Establishment of high consequence SPIs target and alert setting Identification of lower consequence SPI Development of lower consequence SPIs chart Establishment of lower consequence SPI targets and alert settings Agreement with CAA on SPI package Establishment of routing SPI performance monitoring Establishment of SPI alert follow up procedures | 4 | Appendix 6 to Chapter 5 2.12 Fig 2-10 Tables: 5-A6-1 5-A6-2 5-A6-3 5-A6-4 5-A6-5 5-A6-6 5-A6-7 |
| Section 2 - SPI and ALoSP development | Collate potential SPIs Selection of SPIs package Development of SPI charts Incorporation of SPI alerts and target settings Monitoring of individual SPI performance Establishment and achievement of ALoSP | 4 | Tables: 5-A6-1 5-A6-2 5-A6-3 5-A6-4 5-A6-5 5-A6-6 5-A6-7 |
| Section 3 – SMS training programme | Development of SMS training programme Establishment of safety training records system | 2 | CATS 140 |
| Section 4 – Safety information sharing and exchange | Establishment of mechanisms for safety and SMS communication within the organization Establishment of mechanisms to promote safety information sharing internally and externally | 2 | SMS Component 4.2 |
| Section 5 – Internal and External SMS Audit | Establishment of internal SMS audit program Definition of external SMS audit provisions | 2 | SMS Element 3.3 |

14. QUERIES

Any queries or requests for further guidance as a result of this communications should be sent to:
 The Manager, CS: QC & AIR E-mail address:sms@caa.co.za

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|---|------------------------------|-------------------------|
| DEVELOPED BY: | | |
|  | BONGEKILE MTLOKWA | 22 NOVEMBER 2016 |
| SMS TECHNICAL OFFICER | NAME IN BLOCK LETTERS | DATE |
| REVIEWED & VALIDATED BY: | | |
|  | JURIE GOUWS | 22 NOVEMBER 2016 |
| SIGNATURE OF MANAGER: CSD: QUALITY CONTROL-ACCIDENT / INCIDENT INVESTIGATION REVIEW (Act.) | NAME IN BLOCK LETTERS | DATE |
| RECOMMENDED BY: | | |
|  | MARY STEPHENS | 22 NOVEMBER 2016 |
| SIGNATURE OF SENIOR MANAGER: CONSISTENCY AND STANDARDISATION | NAME IN BLOCK LETTERS | DATE |
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|  | SIMON SEGWABE | 22 NOVEMBER 2016 |
| SIGNATURE OF EXECUTIVE: AVIATION SAFETY OPERATIONS | NAME IN BLOCK LETTERS | DATE |

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