



SIERRA LEONE CIVIL AVIATION AUTHORITY

ADVISORY CIRCULAR

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Safety Management Systems for Air Traffic Services

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Director General

Sierra Leone Civil Aviation Authority

1. GENERAL

1.1 Purpose

The purpose of this document is to provide guidance on the implementation of Safety Management Systems (SMS) for Air Traffic Services Provider. It has been developed to give sufficient understanding on SMS concepts and the development of management policies and processes to implement and maintain an SMS that meets ICAO requirements. Therefore, Air Traffic Services Provider is encouraged to refer this document for their principal source of guidance on SMS.

1.2 Applicability

This AC is applicable to Air Traffic Services providers.

1.3 Description of Changes

This is the first AC to be issued on this subject

1.4 References

- (a) SLCAR Part 11
- (b) ICAO Annex 11, Chapter 2
- (c) ICAO Doc 4444 PANS-ATM
- (d) ICAO Doc 9859

1.5 Cancelled Documents

Not Applicable

2. INTRODUCTION

SMS is a proactive and integrated approach to Safety. It should be integrated into the management system of the service provider. It should describe the structure and scope of the organization, available resources, staff accountabilities, authorities and responsibilities and how decisions are taken and managed throughout the Air Traffic Services Provider.

3. SAFETY MANAGEMENT SYSTEM

3.1 SMS is an organized approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures. It is more than a manual and a set of procedures and requires safety management to be integrated into the day to day activities of the organization. It requires the development of an organizational culture that reflects the safety policy and objectives.

At the core of the SMS is a formal Risk Management process that identifies hazards and assesses and mitigates risk. As part of the risk management process it should consider risks generated by contracted activities. Therefore, when the Air Traffic Services provider has a formal agreement with another organization this should include provisions for the management of safety.

4. SAFETY MANAGEMENT SYSTEM IMPLEMENTATION

- 4.1 The first step in the development of any successful SMS is to identify elements currently exist within an organization; this can be achieved by carrying out a thorough gap analysis of the current business, from which an implementation plan can be developed and delivered.
- 4.2 The contents of the implementation plan should include:
- (a) Safety policy;
 - (b) Safety planning, objectives and goals;
 - (c) System description;
 - (d) SMS components;
 - (e) Safety roles and responsibilities;
 - (f) Safety reporting policy;
 - (g) Means of employee involvement;
 - (h) Safety communication;
 - (i) Safety performance measurement;
 - (j) Management review of safety performance;
 - (k) Safety training.

5. THE KEY COMPONENTS OF A SAFETY MANAGEMENT SYSTEM

The SMS should comprise of the following four key components:

- (a) Safety Policy and Objectives;
- (b) Safety Risk Management;
- (c) Safety Assurance;
- (d) Safety Promotion.

5.1 Safety Policy and Objective

- (a) The Safety Policy outlines the methods and processes that the organization will use to achieve desired safety outcomes. It should declare the principles and philosophies that lay the foundation for the organization's safety culture and be communicated to all staff throughout the organization. The creation of a positive safety culture begins with a clear, unequivocal direction and ownership from the Accountable Manager.
- (b) In preparing a safety policy, Senior Management should consult with key staff members in charge of safety critical areas. Consultation will ensure that the safety policy and stated objectives are relevant to all staff and generate a sense of shared responsibility for the safety culture in the organization. A positive safety culture is one where all staff must be responsible for, and consider the impact of, safety on everything they do.
- (c) The Safety Policy and Objectives can be divided into the following five areas:
 - (i) Management Commitment and Responsibility;
 - (ii) Safety Accountabilities;
 - (iii) Appointment of Key Safety Personnel;
 - (iv) Coordination of Emergency Response Planning;
 - (v) SMS Documentation.

(i) Management Commitment and Responsibility

The Accountable Manager should have full responsibility and accountability for the SMS and should have:

- (a) Corporate authority for ensuring all activities can be financed and carried out to the required standard;
- (c) Full authority for ensuring adequate staffing levels;
- (d) Direct responsibility for the conduct of the organization's affairs;
- (e) Final authority over operational matters;
- (f) Final accountability for all safety issues.

Senior Management should:

- (i) Develop the safety policy, which is endorsed and actively supported by the Accountable Manager;
- (ii) Continuously promote the safety policy to all staff and demonstrate their commitment to it;
- (iii) Specify and allocate necessary human and financial resources;
- (iv) Establish safety objectives and performance standards for the SMS. The safety objectives and performance standards should be linked to the safety performance indicators (SPIs), safety performance targets and regulatory safety requirements of the SMS.

(ii) Safety Accountabilities

The Air Traffic Services Provider should clearly define the lines of safety accountability throughout the organization. This should include the direct accountability for safety on the part of the Accountable Manager and senior management. There is also a need to define the safety responsibilities and expected behaviors of key personnel (e.g. Nominated Post-holders, Safety Manager, Safety Officers, Safety committee members). Safety is everyone's responsibility and all staff should be aware of their safety roles and responsibilities. It is essential that safety management is seen as an integral strategic part of the organization's business by assigning the highest priority to safety. With this in mind, there has to be a demonstrable Board level commitment to an effective SMS.

The Accountable Manager, together with the Senior Management team, set the standard for the organization's safety culture. Without this commitment and leadership, SMS will be ineffective.

(iii) Appointment of Key Safety Personnel

Whilst the organizational structure of the SMS should reflect the size, nature and complexity of the organization, consideration should be given to the:

- a) Appointment of a Safety Manager;
- b) Creation of safety committees.

➤ The Safety Manager

The Safety Manager should be a Senior Management appointment in the organization in order to provide the necessary degree of authority when dealing with safety matters and should report directly to the Accountable Manager of the organization.

➤ The Safety Manager should possess:

- (a) Broad operational knowledge and experience in the functions of the organization and the supporting systems;
- (b) Sound people skills;
- (c) Analytical and problem solving skills;
- (d) Project management skills;
- (e) Effective oral and written communication skills;
- (f) An understanding of human and organizational factors;
- (g) Sound knowledge of safety management principles and practices.

It is important to note that accountability for the SMS lies with the Accountable Manager not the Safety Manager.

The Safety Manager is responsible for, and is the focal point for, the development, administration and maintenance of the SMS.

The Safety Manager should be a full-time employee although in a smaller less complex organization it may be a part time role shared with other duties.

➤ The Safety Manager should carry out at least the following functions:

- (a) Manage the SMS implementation plan on behalf of the Accountable
- (b) Manager;
- (c) Facilitate the risk management process that should include hazard
- (d) identification, risk assessment and risk mitigation;
- (e) Monitor corrective actions to ensure their accomplishment;
- (f) Provide periodic reports on safety performance;
- (g) Maintain safety documentation;
- (h) Ensure that there is safety management training available and that it
- (i) meets acceptable standards;
- (j) Provide independent advice on safety matters;
- (k) Oversee hazard identification systems;
- (l) Involvement in occurrence / accident investigations;
- (m) To collate, understand and disseminate information from other similar organizations, the regulator and contracted organizations.

➤ Safety Committees

➤ Safety Review Board

The Safety Review Board (SRB) is a high level committee which considers strategic safety functions. The Board should be chaired by the Accountable Manager and should normally include the senior management of the organization. Membership of the Board and frequency of meetings should be defined. Directors of the organization may be included in the SRB.

The SRB ensures that appropriate resources are allocated to achieve the established safety performance and gives strategic direction to the safety action group.

➤ **The SRB monitors:**

- i) Safety performance against the safety policy and objectives;
- ii) Effectiveness of the SMS implementation plan;
- iii) Effectiveness of the safety oversight of sub-contracted organizations;
- iv) Necessary corrective or mitigating actions are being taken in a timely
- v) manner;
- vi) Effectiveness of the organization's safety management processes.

➤ **Safety Action Group**

A safety action group should be established as a standing group or as an adhoc group to assist or act on behalf of the SRB. The Safety Action Group (SAG) reports to and takes strategic direction from the SRB. It is comprised of managers, supervisors and staff from operational areas. Membership of the Group and frequency of meetings should be defined. The Safety Manager may also participate in the SAG.

➤ **The SAG oversees and reviews:**

- i) Operational safety of the safety risk management processes;
- ii) Appropriate resolution and mitigation of identified risks;
- iii) Assessment of the impact on safety of operational changes;
- iv) Implementation of corrective action plans;
- v) Corrective action is achieved within agreed timescales;
- vi) The effectiveness of previous safety recommendations and safety
- vii) promotion.

(iv) Coordination of Emergency Response Planning

An Emergency Response Plan (ERP) should be established that provides the actions to be taken by the organization or individuals in an emergency. The emergency response plan should be integrated into the SMS and reflect the size, nature and complexity of the activities performed by the organization.

Where organizations, such as aerodromes, are subject to other Emergency Planning and Response requirements these should be adhered to and may be cross referred to.

The ERP should ensure:

- (a) An orderly and efficient transition from normal to emergency operations;
- (b) Designation of emergency authority;
- (c) Assignment of emergency responsibilities;
- (d) Authorization by key personnel for actions contained in the plan;
- (e) Coordination of efforts to resolve the emergency;
- (f) Safe continuation of operations or return to normal operations as soon
- (g) as practicable.

The ERP should set out the responsibilities, roles and actions for the various agencies and personnel involved in dealing with emergencies. It may include checklists and contact details and the ERP should be regularly reviewed and tested. Key personnel should have easy access to the ERP at all times

- SMS Documentation
- Documentation for a SMS should be representative of the nature, scale and complexity of the organization and normally consists of:
 - i) References to all applicable regulations;
 - ii) SMS records (e.g. Hazard logs, risk assessments, safety cases);
 - iii) Records management;
 - iv) SMS manual.
- The safety policy should include a commitment to:
 - i) Achieve the highest safety standards;
 - ii) Comply with all applicable legal requirements, meet all applicable standards and consider best practice;
 - iii) Provide appropriate resources;
 - iv) Enforce safety as a primary responsibility of all Managers;
 - v) Ensure that the policy is implemented and understood at all levels, both internally and externally.

The safety policy should actively encourage effective safety reporting and, by defining the line between acceptable and unacceptable performance, provide fair and just protection to reporters.

- The organization's SMS manual should be the key instrument for communicating the approach to safety for the whole of the organization and should document all aspects of the SMS, including the safety policy, objectives, procedures and individual safety accountabilities. The SMS should be constantly evolving and therefore the SMS manual should be a living document and should be reviewed regularly to ensure that it remains accurate and appropriate. The SMS manual may be incorporated into existing manuals or expositions. Contents should include:
 - i) Scope of the SMS;
 - ii) Safety policy and objectives;
 - iii) Safety accountabilities;
 - iv) Key safety personnel;
 - v) Documentation control procedures;
 - vi) Hazard identification and risk management schemes;
 - vii) Safety performance monitoring;
 - viii) Incident investigation and reporting
 - ix) Emergency response planning;
 - x) Management of change processes;
 - xi) Safety promotion;
 - xii) Contracted activities;
 - xiii) Just culture policy and culpability definition.

5.2 Safety Risk Management

The Safety Risk component of a SMS can be divided into three areas:

- (a) Hazard identification processes;
- (b) Risk assessment and mitigation processes;
- (c) Internal safety investigation

The safety risk management process starts with identifying hazards affecting aviation safety and then assessing the risks associated with the hazards in terms of severity and likelihood. Once the level of risk is identified, appropriate remedial action or mitigation measures can be implemented to reduce the level of risk to as low as reasonably practicable. The implemented mitigation measures should then be monitored to ensure that they have had the desired effect. It is important to ensure a common standard and process for Hazard Identification Risk Assessment and Control is implemented throughout the organization. Appropriate training and education will ensure a clear understanding on how to deliver this.

(a) Hazard Identification

A hazard is any situation or condition that has the potential to cause adverse consequences. A hazard identification process is the formal means of collecting, recording, analyzing, acting on and generating feedback about hazards that affect the safety of the operational activities of the organization. In a mature SMS hazard identification is an ongoing process.

The scope of hazard identification is across the operational activities of the organization with data derived from reactive and proactive schemes. Reactive schemes include data from accidents, incidents, flight data monitoring, voluntary and confidential reporting systems. Proactive schemes include open hazard reporting systems and safety surveys and safety assessments. Managed group sessions can also be used to proactively identify hazards. Organizations should carry out an initial hazard identification exercise on its current operations to create a baseline safety case / hazard log for the organization and its activities that should be continuously reviewed and updated.

(b) Risk Assessment and Mitigation

(i) Risk

Risk is the assessed potential in terms of severity and likelihood of the consequences of a hazard considering the worst case scenario. A hazard has the potential to cause harm while risk is the likelihood of that harm being realized within a specific time-scale.

Following the identification of a hazard, a risk assessment is carried out to determine the potential for harm or damage. This involves the following considerations:

- a) Severity: The severity of the possible consequences of an unsafe event or condition;
- b) Likelihood: The likelihood that an unsafe event or condition will occur.

Risk Assessment and Mitigation Processes analyze and eliminate or mitigate to an acceptable level, risks that could threaten the capability of an organization to undertake its activities in a safe manner

(ii) Risk Assessment

The risk assessment process requires a Risk Tolerability Matrix to be defined for assessing hazards and should be included in the SMS documentation.

(iii) Risk Mitigation

Risks should be managed to as low as reasonably practicable. Risk must be balanced against the time, cost and difficulty of taking measures to reduce or eliminate the risk.

The level of risk can be lowered by reducing the severity of the potential consequences, reducing the likelihood of occurrence or by reducing exposure to that risk. Corrective action will take into account any existing defenses and their inability to achieve an acceptable level of risk. Corrective action should be subject to further risk assessment as outlined in paragraph 7.2.2 above, in order to determine that the risk is now acceptable and that no further risk has been introduced into operational activities. Risk mitigations and controls will need to be verified / audited to ensure that they are effective.

(c) Internal Safety Investigations

The scope of internal safety investigations should include occurrences that are not required to be investigated or reported to the CAA. Though often of a supposed minor nature, they could be indicative of a potential hazard or trend that would only be revealed through systematic investigation and data analysis, ideally undertaken by trained investigators.

(i) Scope of Safety Investigations

The scale and scope of any investigation should be suitable to determine why an event occurred and validate or identify the underlying hazards. The level of investigation should be proportional to the identified hazard and risk.

(ii) Investigation Methodology

The investigation process should take place as soon as possible after the event. The objective of the investigation is to understand why an event happened and the contributing causes and not to apportion blame. The investigation may include:

- a) Review of documentation and processes;
- b) Operational data monitoring;
- c) Interviews;
- d) Data analysis

5.3 Safety Assurance

Safety assurance assesses the safety performance of the organization and enables continuous improvement. The three aspects of safety assurance are:

- (a) Safety performance monitoring, measurement and review;
- (b) The management of change;
- (c) Continuous improvement of the safety system.

5.3.1 Safety Performance Monitoring and Measurement

Safety performance monitoring and measurement is the process by which the safety performance of the organization is verified in comparison to its safety policies and objectives.

This process should include:

- (a) Safety reporting;
- (b) Safety studies;
- (c) Safety reviews including trend analysis;
- (d) Internal safety audits;
- (e) Surveys;
- (f) Internal safety investigations.

5.3.1.1 Safety audits are used to ensure that the structure of the SMS is sound in terms of:

- (a) Adequate staff levels;
- (b) Compliance with approved procedures and instructions;
- (c) Levels of competency and training to carry out specific roles;
- (d) Maintaining required levels of performance;.
- (e) Achievement of the safety policy and objectives;
- (f) Effectiveness of interventions and risk mitigations.

5.3.1.2 Safety and cultural surveys examine particular elements or processes of a specific operation and may involve the use of:

- (a) Checklists;
- (b) Questionnaires;
- (c) Informal confidential interviews.

Survey information is subjective and should therefore be verified before any corrective action is initiated but may provide an inexpensive source of safety information. Cultural surveys allow an organization to identify behaviors and attitudes of staff that may help determine latent conditions that can affect an organization's SMS.

5.3.2 The Management of Change

The Management of Change should be a formal process that identifies external and internal change that may affect established cultures, processes and services. It utilizes the organization's existing risk management process to identify potential hazards that will ensure that there is no adverse effect on safety. Change can introduce new hazards that could impact the appropriateness and effectiveness of any existing risk mitigation.

5.3.3 Continuous Improvement of the SMS

The organization should continually seek to improve their safety performance.

Continuous improvement should be achieved through:

- (a) Proactive evaluation of day to day operations, facilities, equipment, documentation and procedures through safety audits and surveys;
- (b) Evaluation of an individual's performance to verify the fulfillment of their safety responsibilities;
- (c) Reactive evaluations in order to verify the effectiveness of the system for control and mitigation of risk e.g. incidents, accidents and investigations;
- (d) Tracking organizational changes to ensure that they are effective.

5.4 Safety Promotion

5.4.1 Training and Education:- All staff should receive safety training as appropriate for their safety responsibilities. In particular all Operational Staff, Managers, Supervisors, Senior Managers and the Accountable Manager should be trained and be competent to perform their duties. This provides an opportunity to reinforce the safety policy, gain the necessary management buy-in and for establishing the expected attitudes and behaviors for all levels of staff in the organization. This should involve initial training as well as continued maintenance of competence. Training should include human and organizational factors Operational Staff should have an understanding of the organization's safety policy and principles and an overview of the fundamentals of SMS. In addition, Managers and Supervisors should understand the safety process, hazard identification, risk management and the management of change. In addition to the above, Senior Managers should understand organizational safety standards, safety assurance and the regulatory requirements for their organization.

The Accountable Manager should have an awareness of SMS roles and responsibilities, safety policy, safety culture, SMS standards and safety assurance.

5.4.2 Safety Communication

Safety communication is an essential foundation for the development and maintenance of an adequate safety culture. Types of communication may include:

- (a) Safety policies and procedures;
- (b) News letters, safety bulletins and notices;
- (c) Presentations;
- (d) Websites and e-mails;
- (e) Informal workplace meetings between staff and the Accountable Manager or

Senior Managers

Safety communication should:

- (a) Ensure that all staff are fully aware of the SMS and the organization's safety culture;
- (b) Disseminate safety critical information internally and externally;
- (c) Explain why certain actions are taken;
- (d) Explain why safety procedures are introduced or changed;
- (e) Compliment and enhance the organization's safety culture;
- (f) Contain a process for assessing the suitability of safety communication and its effect on the organization.