



Republika e Kosovës
Republika Kosovo - Republic of Kosovo



Autoriteti i Aviacionit Civil i Kosovës
Autoritet Civilnog Vazduhoplovstva Kosova
Civil Aviation Authority of Kosovo

Technical Publication – TP 26

Safety Management System (SMS) for Service Providers

Guidance Material

Foreword

This Technical Publication is intended to provide guidance material to service providers on the implementation of Safety Management Systems (SMS). It has been developed to give sufficient understanding of SMS concepts and the development of management policies and processes to implement and maintain an effective SMS.

SMS is a system for the management of safety at organisations, including the organisational structure, responsibilities, procedures, processes and provisions for the implementation of safety policies by service provider, which provides for control of safety at, and the safe operation of the organisation. It is a systematic and proactive approach to assure the safe operation of any organisation through effective management of safety risk. SMS includes goal setting, planning, and measuring performance. An effective safety management system becomes part of the culture; the way people do their jobs.

It is important to recognize that SMS is a top down driven system, which means that the Accountable executive of the organisation is responsible for the implementation and continuing compliance of the SMS. Without the wholehearted support and ownership of the Accountable executive the SMS will not be effective. However, safety is a shared responsibility across the whole organisation and needs the involvement of all staff.

This technical publication applies to service providers obliged to establish a Safety Management System (SMS) in accordance with ICAO Annex 19, its transposing regulation and in accordance with other applicable legislation, in particular:

- Approved training organisations in accordance with Annex 1 that are exposed to safety risks related to aircraft operations during the provision of their services;
- Operators of aeroplanes or helicopters authorized to conduct international commercial air transport, in accordance with ICAO Annex 6, Part I or Part III, Section II, respectively;
- Approved maintenance organisations providing services to operators of aeroplanes or helicopters engaged in international commercial air transport, in accordance with ICAO Annex 6, Part I or Part III, Section II, respectively;
- Organisations responsible for the type design or manufacture of aircraft, engines or propellers, in accordance with ICAO Annex 8;
- Air traffic services (ATS) providers, in accordance with ICAO Annex 11; and
- Operators of certified aerodromes, in accordance with ICAO Annex 14, Volume I and Volume II. Operators of approved and registered aerodromes are also encouraged to introduce a SMS at their aerodromes.

This guidance material meets International Civil Aviation Organization standards and ICAO Doc. 9859 "Safety Management Manual (SMS)" requirements and shall be read together with those documents. It is not intended to provide all requirements for an SMS nor is a substitute of other requirements on SMS that may be required under relevant legislation of EU, EASA or other applicable sub-legal acts issued by the CAA.

Dritan Gjonbalaj
Director General
Civil Aviation Authority

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	Name and position	Date	Signature
Prepared by:	Emir Hiseni, Inspector, Aerodromes Department	22.07.2016	
Authorised by:	Burim Dinarama, Director, Aerodromes Department	27.07.2016	
	Arianit Islami, Director, ANS Department		
	Kushtrim Musa, Director, Flight Safety Department		
Quality Check:	Lendita Kika-Berisha, Quality and Safety Manager	01.08.2016	
Approved by:	Dritan Gjonbalaj, Director General	02.08.2016	

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Glossary

ALARP	As Low As Reasonably Practicable
ALoS	Acceptable Level of Safety
ANS	Air Navigation Services
HIRA	Hazard Identification and Risk Assessment
CAA	Civil Aviation Authority
CBA	Cost-benefit analysis
CVR	Cockpit Voice Recorder
EOC	Emergency Operations Centre
ERP	Emergency Response Plan
FDR	Flight Data Recorder
ICAO	International Civil Aviation Organisation
OEM	Original Equipment Manufacturer
OSC	On-scene Command
OSHE	Occupational Safety, Health and Environment
SeMS	Security Management System
SMS	Safety Management System
SPI	Safety Performance Indicators
QMS	Quality Management System

Terms and Definitions

In this manual, the terms and definitions are conform to those in Law No. 03/L-051 on Civil Aviation, all relevant regulations in force in the Republic of Kosovo and ICAO Annexes to the Convention on International Civil Aviation. However, some of the frequently used terms are given below for ease of reference to the user:

Term	Definition
Accident	<p>An occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:</p> <p>a) a person is fatally or seriously injured as a result of:</p> <ul style="list-style-type: none"> • being in the aircraft, or • direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or • direct exposure to jet blast, <p>except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or</p> <p>b) the aircraft sustains damage or structural failure which:</p> <ul style="list-style-type: none"> • adversely affects the structural strength, performance or flight characteristics of the aircraft, and • would normally require major repair or replacement of the affected component, <p>except for engine failure or damage, when the damage is limited to a single engine, (including its cowlings or accessories), to propellers, wing tips, antennas, probes, vanes, tires, brakes, wheels,</p>

	<p>fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes), or for minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike (including holes in the radome); or</p> <p>c) the aircraft is missing or is completely inaccessible</p>
Aerodrome	Aerodrome means a defined area on land or water (including any buildings, installations and equipment) intended or designed to be used either wholly or partly for the arrival, departure and surface movement of aircraft.
Aircraft	Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.
Aerodrome operator	Any person or legal entity authorized by the Authority to manage and operate an aerodrome.
Acceptable Level of Safety (ALoS)	Acceptable Level of Safety expresses the safety performance indicator benchmark or alert level(s) of an organisation. They are the minimum safety performance deemed acceptable to an organisation while conducting their core business functions. They are subject to acceptance by the CAA.
Authority	Civil Aviation Authority of the Republic of Kosovo.
Hazard	A condition or an object with the potential to cause death, injuries to personnel, damage to equipment or structures, loss of material, or reduction of the ability to perform a prescribed function. For the purpose of aviation safety risk management, the term hazard should be focused on those conditions which could cause or contribute to unsafe operation of aircraft or aviation safety-related equipment, products and services.
Hazard Identification	The process of identification of the hazard.
Mitigation	Measures to eliminate a hazard or to reduce the probability/severity of a risk.

Organisation	Within the context of this document, the term <i>organisation</i> refers to any service provider providing aviation services.
Probability	Likelihood that a situation of danger might occur.
Reporting system	Systematic activity of aeronautical events collection for the purposes of monitoring of safety standards.
Risk index	Combined value of risk probability and severity.
Safety	The state in which risks associated with aviation activities, related to, or in direct support of the operation of aircraft, are reduced and controlled to an acceptable level.
Safety assessment	The process or action of performing hazard identification and risk analysis.
Safety management system (SMS)	A systematic approach to managing safety, including the necessary organisational structures, accountabilities, policies and procedures.
Safety objective	The result that you want to achieve in terms of commitment and activity.
Safety performance	A service provider's safety achievement as defined by its safety performance targets and safety performance indicators.
Safety performance indicator	A data-based safety parameter used for monitoring and assessing safety performance.
Safety performance target	The planned or intended objective for safety performance indicator(s) over a given period.
Safety responsibility	Identification of tasks, powers and responsibilities assigned to each party in the organisation.
Safety risk	The predicted probability and severity of the consequences or outcomes of a hazard.
Service Provider	An organisation providing aviation services, including approved training organisations that are

exposed to safety risks during the provision of their services, aircraft operators, approved maintenance organisations (AMO & CAMO), approved organisations responsible for type design and/or manufacture of aircraft, air navigation service providers, certified aerodromes and suppliers of ground-handling services exposed to safety risks during provision of their services.

Severity

The possible consequences of a situation of danger, taking as reference the worst foreseeable situation.

Chapter 1 - Safety Management System (SMS)

1.1 General

Safety cannot be achieved by simply introducing rules or directives concerning the procedures to be followed by operational employees. 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 organisation. It encompasses most of the activities of the organisation. For this reason, safety management must start from senior management, and the effects on safety must be examined at all levels of the organisation.

Safety Management System is a systematic, explicit and proactive process for managing safety that integrates operations and technical systems with financial and human resource management to achieve safe operations with as low as reasonably practicable risk. It is systematic in that safety management activities are carried out in accordance with a predetermined plan, and applied in a consistent manner throughout the organisation. It is proactive by taking an approach that emphasizes prevention, through hazards identification and risk control and mitigation measures, before events that affect safety occur. It is also explicit, in that all safety management activities are documented, visible and performed as an essential component of management activities. People, procedures, practices and technology needed to monitor and improve the safety of the aviation transportation system. Safety management may be also described as the systematic application of specific technical and managerial skills to identify and control hazards and related risks. By identifying, assessing and eliminating or controlling safety-related hazards and risks, acceptable levels of safety will be achieved.

At the core of the SMS is a formal risk management process that identifies hazards and assesses and mitigates risk. It is important to recognize that even with mitigations in place, some residual risk will remain and an effective SMS will enable organisations to manage this.

Risks generated by contracted activities and other third parties should also be considered. Therefore, when the organisation has a formal agreement with another organisation this should include provisions for the management of safety. This should also include reporting procedures for safety related matters.

1.2 Safety Management System implementation

The SMS requires proactive management of safety issues.

This system is reflected in an organisational model more advanced compared to the current structures, therefore, its implementation can lead in principle to change in relation to the different allocation of responsibility for the management and tasks and objectives assigned.

The application of the SMS should be modulated taking into account the overall characteristics of the organisation (size, type, structure of management companies, etc.).

The implementation of an SMS does not necessarily involve the production or duplication of additional documents, but may be limited to an adaptation of the existing documentation.

Chapter 2 - The key components of a Safety Management System

2.1 General

The SMS should comprise of the following four key components:

- 1) Safety policy and objectives;
- 2) Safety risk management;
- 3) Safety assurance;
- 4) Safety promotion.

Whilst the four components above appear to be separate, it is important to recognize that they are all interrelated. They can only function effectively if all four are built on a foundation of a positive safety culture. This should be driven from the top of the organisation by the Accountable executive and the senior management team.

The four components and twelve elements that comprise the ICAO SMS framework are as follows:

1. Safety policy and objectives
 - 1.1 Management commitment and responsibility
 - 1.2 Safety accountabilities
 - 1.3 Appointment of key safety personnel
 - 1.4 Coordination of emergency response planning
 - 1.5 SMS documentation
2. Safety risk management
 - 2.1 Hazard identification
 - 2.2 Safety risk assessment and mitigation
3. Safety assurance
 - 3.1 Safety performance monitoring and measurement
 - 3.2 The management of change
 - 3.3 Continuous improvement of the SMS
4. Safety promotion
 - 4.1 Training and education
 - 4.2 Safety communication.

General guidance/implementation strategies for each element are presented in the following chapters.

Chapter 3 – Safety Policy and Objectives

The safety policy and objectives can be divided into the following five areas:

1. Management commitment and responsibility;
2. Safety accountabilities;
3. Appointment of key safety personnel;
4. Coordination of emergency response planning;
5. SMS documentation.

The safety policy outlines the aims and objectives that the organisation will use to achieve the desired safety outcomes. It should declare the principles and philosophies that lay the foundation for the organisation's safety culture and be communicated to all staff throughout the organisation. The creation of a positive safety culture begins with clear, unequivocal direction and ownership from the Accountable executive.

In preparing a safety policy, senior management should consult with the key safety personnel, and where appropriate, staff representative bodies (employee forums, trade unions, etc.). Consultation will ensure that the safety policy and stated objectives are relevant to all staff. It will generate a sense of shared responsibility for the safety culture in the organisation. A positive safety culture is one where all staff is responsible for, and considers the impact of, safety on everything they do.

3.1 Management commitment and responsibility

The senior management of the organisation led by the Chief Executive Officer/Accountable executive is ultimately responsible for the entire organisation's attitude towards safety. Its organisation safety culture will depend on the senior management's level of commitment toward safe operations. Regardless of the size, complexity, or type of operation, the success of the SMS depends on the extent to which senior management devotes the necessary time, resources and attention to safety as a core management issue. A safety management system will not be effective if it receives attention only at the operational level. CAA therefore considers it is the responsibility of the Accountable executive to effectively implement the organisation's safety management system.

The Accountable executive, having full authority over human resources and financial issues, must ensure that the necessary resources are allocated to the management of safety. He/she has direct responsibility for the conduct of the organisation's affairs and final responsibility for all safety issues. Senior management's commitment to safety is first demonstrated to the organisation's staff through its stated safety policies, objectives and goals.

The Accountable executive 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;
- b) Full authority for ensuring adequate staffing levels;
- c) Direct responsibility for the conduct of the organisation's affairs;
- d) Final authority over operational matters;
- e) Final accountability for all safety issues.

The senior management has to show its commitment by developing a safety policy, communicating the policy to its staff and establishing safety objectives and goals for the organisation. The written safety policy is a concrete expression of the management's philosophy and commitment to safety. It should clearly encapsulate the senior management's commitment to improving aviation safety as their top priority.

Senior Management should:

- a) Develop the safety policy, which is endorsed and actively supported by the Accountable executive;
- b) Continuously promote the safety policy to all staff and demonstrate their commitment to it;
- c) Specify and allocate necessary human and financial resources;
- d) Establish safety objectives and performance standards for the organisation. Safety Performance Indicators (SPIs) should be established that monitor and measure the safety performance of the organisation and the effectiveness of the SMS.

The safety policy should actively encourage effective safety reporting by defining a "just culture". "Just Culture" is a culture in which front-line operators and others are not punished for actions, omissions or decisions taken by them which are commensurate with their experience and training, but where gross negligence, wilful violations and destructive acts are not tolerated.

This safety policy should bear visible endorsement by the Accountable executive and all members of the organisation's senior management team, and communicated to all levels within the organisation. It should be clear, concise and confirm top level management support, be signed by the Accountable executive, and include a commitment to:

- implementing a SMS based on the safety policy;
- assurance of senior management accountability;
- provide management guidance for setting, reviewing and achieving safety objectives and safety targets through the management of safety risks;

- provision of the resources necessary for effective safety management and ensuring staff are sufficiently trained and aware of their safety responsibilities and accountability for safety at all levels of the organisation;
- management's explicit support of a 'reporting culture', as part of the overall safety culture of the organisation, i.e. encouragement of a culture that is against acts of reprisal against employees that report safety issues;
- to complying with all applicable legal/legislative requirements, standards and best practice;
- communication with all employees and parties;
- establishing and maintaining standards for acceptable safety behaviour;
- active encouragement of safety reporting;
- integrating safety management with other critical management systems within the organisation;
- promotion and demonstration of their commitment to the Safety Policy through active and visible participation in the SMS; and
- periodic review of the safety policy to ensure it remains relevant and appropriate to the organisation.

The example of safety policy statement is presented below.

SAFETY POLICY STATEMENT

Safety is one of our core business functions. We are committed to developing, implementing, maintaining and constantly improving strategies and processes to ensure that all our aviation activities take place under an appropriate allocation of organisational resources, aimed at achieving the highest level of safety performance and meeting regulatory requirements, while delivering our services.

All levels of management and all employees are accountable for the delivery of this highest level of safety performance, starting with the [Chief executive officer (CEO)/managing director/or as appropriate to the organisation].

Our commitment is to:

- support the management of safety through the provision of all appropriate resources that will result in an organisational culture that fosters safe practices, encourages effective safety reporting and communication, and actively manages safety with the same attention to results as the attention to the results of the other management systems of the organisation;
- ensure that the management of safety is a primary responsibility of all managers and employees;
- clearly define, for all staff, managers and employees alike, their accountabilities and responsibilities for the delivery of the organisation's safety performance and the performance of our safety management system;
- establish and operate hazard identification and risk management processes, including a hazard reporting system, in order to eliminate or mitigate the safety risks of the consequences of hazards resulting from our operations or activities, to achieve continuous improvement in our safety performance;
- ensure that no action will be taken against any employee who discloses a safety concern through the hazard reporting system, unless such disclosure indicates, beyond any reasonable doubt, gross negligence or a deliberate or wilful disregard of regulations or procedures;
- comply with and, wherever possible, exceed, legislative and regulatory requirements and standards;
- ensure that sufficient skilled and trained human resources are available to implement safety strategies and processes;
- ensure that all staff are provided with adequate and appropriate aviation safety information and training, are competent in safety matters, and are allocated only tasks commensurate with their skills;
- establish and measure our safety performance against realistic safety performance indicators and safety performance targets;
- continually improve our safety performance through continuous monitoring and measurement, regular review and adjustment of safety objectives and targets, and diligent achievement of these; and
- ensure that externally supplied systems and services to support our operations are delivered meeting our safety performance standards.

(Signed) _____
CEO/Managing Director/or as appropriate

3.2 Safety accountabilities

The organisation should clearly define the lines of safety accountability throughout the organisation. This should include the direct accountability for safety on the part of the Accountable executive and senior management. There is also a need to define the safety responsibilities and expected behaviours of key personnel (nominated post-holders, safety manager, safety officers, safety committee members, for example).

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 organisation'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 executive, together with the senior management team, should set the standard for the organisation's safety culture. Without this commitment and leadership, SMS will be ineffective.

The safety accountabilities and responsibilities of all relevant departmental and/or unit managers, and in particular line managers, should be described in the organisation's Safety Management Systems Manual. It should include an accountability chart in terms of the delivery of safety as a core business process. It must be emphasized that the primary responsibility for safety outcomes rests with those who 'own' the production processes. It is where hazards are directly encountered, where deficiencies in processes contribute to safety risks, and where direct supervisory control and resource allocation can mitigate the safety risks to acceptable levels. The line managers are responsible for the management of an identified safety concern, its mitigation activities and subsequent performance.

3.3 Appointment of key safety personnel

The successful management of safety is a cooperative responsibility that requires the participation of all relevant management and operational/support personnel of the organisation. The safety roles and accountabilities between the organisation's key SMS personnel and the various functional departments should be established and defined. They should be documented and communicated to all levels of the organisation.

Whilst the organisational structure of the SMS should reflect the size, nature and complexity of the organisation it should:

- a) Appoint a safety manager, and
- b) Create appropriate safety committees.

3.3.1. The safety manager

Although the Accountable executive is ultimately responsible for the safety management system, it is necessary to appoint a focal point to act as the driving force for the implementation and maintenance of SMS activities through the entire organisation. This could be accomplished by appointing a safety (SMS) manager whose primary responsibility is to facilitate and administer the organisation's SMS. The safety manager advises the Accountable executive and line managers on safety management matters and is responsible for coordinating and communicating safety issues within the organisation, as well as with external stakeholders. It is essential that safety manager have direct access to the Accountable executive.

The safety manager's functions include, but are not necessarily limited to:

- a) Managing the SMS implementation plan on behalf of the accountable executive;
- b) Performing/facilitating hazard identification and safety risk analysis;
- c) Monitoring corrective actions and evaluating their results;
- d) Providing periodic reports on the organisation's safety performance;
- e) Maintaining records and safety documentation;
- f) Planning and facilitating staff safety training;
- g) Providing independent advice on safety matters;
- h) Monitoring safety concerns in the aviation industry and their perceived impact on the organisation's operations aimed at service delivery;
- i) Coordinating and communicating (on behalf of the Accountable executive) with the CAA and other State agencies as necessary on issues relating to safety; and
- j) Coordinating and communicating (on behalf of the Accountable executive) with international organisations on issues relating to safety.

It must be emphasized that the safety manager is not the sole person responsible for aviation safety. Specific safety activities and the functional or operational safety performance and outcomes are the responsibility of the relevant operational or functional managers, so senior management should not hold the safety manager accountable for line managers' responsibilities. The safety manager should monitor all cross functional or departmental SMS activities to ensure their relevant integration. While the safety manager may be held accountable for the satisfactory administration and facilitation of the safety management system itself, he or she should not be held accountable for the safety performance of the organisation. In order to avoid possible conflict of interest, the safety manager should not have conflicting responsibility for any of the operational areas. The safety manager should be at a sufficiently high level in the management hierarchy to ensure that he or she can have direct communication with other members of the senior management team.

The selection criteria for a safety manager should include, but not be limited to, the following:

- a) Safety/quality management experience;
- b) Operational experience;
- c) Technical background to understand the systems that support operations;
- d) People skills;
- e) Analytical and problem-solving skills;
- f) Project management skills; and
- g) Oral and written communications skills.

3.3.2. Safety committee

A Safety Committee would normally be necessary for functional or senior management involvement on safety policy, overall system implementation and safety performance review purposes. Scope of participation in the safety committee would depend on the size and structure of the organisation. The Accountable executive should chair this committee with all relevant functional areas of the organisation being represented.

A safety committee would typically consist of the Accountable executive, the safety manager and other members of the senior management team. The objective of the safety committee is to provide a forum to discuss safety issues and the overall health and direction of the SMS. The role of the safety committee would include:

1. Making recommendations/decisions concerning safety policy and objectives;
2. Defining safety performance indicators and set safety performance goals for the organisation;
3. Reviewing safety performance and ensuring that corrective actions are taken in a timely manner;
4. Directing and monitoring the implementation and effectiveness of the SMS process;
5. Ensuring that appropriate resources are allocated to achieve the established safety performance;
6. Monitoring of the safety performance against the organisation's safety policy and objectives;
7. Monitoring the effectiveness of the safety oversight of sub-contracted organisations;
8. Monitoring that corrective or mitigating actions are being taken in a timely manner;

Note: Should the Accountable executive choose to assign this task to an appropriate senior person, it should be clearly stated and substantiated in the SMS manual that he is performing the task on behalf of the Accountable executive whose accountability for safety at paragraph 3.1 is not compromised and that he remains accountable for all decisions of the safety committee.

Terms of reference for the safety committee should be documented in the SMS manual.

3.4 Coordination of emergency response planning

Successful response to an emergency begins with effective planning. An Emergency Response Plan (ERP) provides the basis for a systematic approach to managing the organisation's affairs in the aftermath of a significant unplanned event – in the worst case, a major accident.

An emergency response plan outlines in writing what should be done after an accident or aviation crisis and who is responsible for each action. Among different product and service providers, such emergency planning may be known by different terms such as contingency plan, crisis management plan and continuing airworthiness support plan. In this manual, the generic term emergency response plan (ERP) is used to address the relevant contingency plans expected of aviation service providers whose products/services may have an impact on aviation safety.

The emergency response plan shall be integrated into the SMS and reflect the size, nature and complexity of the activities performed by the organisation.

Where organisations, such as aerodromes, are subject to other ERP requirements, these should be adhered to and may be cross referred to. In many cases there will be a need for liaison with other relevant parties to agree coordination of emergency response arrangements and testing of the plan. The aerodrome operator shall ensure that an ERP is properly coordinated with the emergency response plans of those organisations.

The purpose of an emergency response plan is to ensure:

- a) Delegation of emergency authority;
- b) Assignment of emergency responsibilities;
- c) Documentation of emergency procedures and processes;
- d) Coordination of emergency efforts internally and with external parties;
- e) Safe continuation of essential operations while the crisis is being managed;
- f) Proactive identification of all possible emergency events/scenarios and their corresponding mitigation actions, etc.

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.

To be effective, an ERP should:

- a) Be appropriate to the size, nature and complexity of the organisation;

- b) Be readily accessible to all relevant personnel and other organisations where applicable;
- c) Include checklists and procedures relevant to specific emergency situations;
- d) Have quick-reference contact details of relevant personnel;
- e) Be regularly tested through exercises;
- f) Be periodically reviewed and updated when details change, etc.

An ERP would normally be documented in the format of a manual that should set out the responsibilities, roles and actions of the various agencies and personnel involved in dealing with specific emergencies. An ERP should take account of such considerations as:

1. *Governing policies.* The ERP should provide direction for responding to emergencies, such as governing laws and regulations for investigations, agreements with local authorities, company policies and priorities.
2. *Organisation.* The ERP should outline management's intentions with respect to the responding organisations by:
 - a) designating who will lead and who will be assigned to the response teams;
 - b) defining the roles and responsibilities of personnel assigned to the response teams;
 - c) clarifying the reporting lines of authority;
 - d) setting up an emergency management centre (EMC);
 - e) establishing procedures for receiving a large number of requests for information, especially during
 - f) the first few days after a major accident;
 - g) designating the corporate spokesperson for dealing with the media;
 - h) defining what resources will be available, including financial authorities for immediate activities;
 - i) designating the company representative to any formal investigations undertaken by State officials;
 - j) defining a call-out plan for key personnel.

An organisational chart could be used to show organisational functions and communication relationships.

3. *Notifications.* The plan should specify who in the organisation should be notified of an emergency, who will make external notifications and by what means. The notification needs of the following should be considered:
 - a) Management;
 - b) State authorities (search and rescue, the regulatory authority, the accident investigation board, etc.);

- c) Local emergency response services (aerodrome authorities, fire fighters, police, ambulance, medical agencies, etc.);
 - d) relatives of victims (a sensitive issue that, in many States, is handled by the police);
 - e) Company personnel;
 - f) Media; and
 - g) Legal, accounting, insurers, etc.
4. *Initial response.* Depending on the circumstances, an initial response team may be dispatched to the accident or crisis site to augment local resources and oversee the organisation's interests. Factors to be considered for such a team include:
- 1. Who should lead the initial response team?
 - 2. Who should be included on the initial response team?
 - 3. Who should speak for the organisation at the accident site?
 - 4. What would be required by way of special equipment, clothing, documentation, transportation, accommodation, etc.?
5. *Additional assistance.* Employees with appropriate training and experience can provide useful support during the preparation, exercising and updating of an organisation's ERP. Their expertise may be useful in planning and executing such tasks as:
- a) Acting as passengers or customers in exercises;
 - b) Handling survivors or external parties;
 - c) Dealing with next of kin, authorities, etc.
6. *Emergency operations centre (EOC).* An EOC (normally on standby mode) may be established at the organisation's headquarters once the activation criteria have been met. In addition, an on-scene command (OSC) may be established at or near the crisis site. The ERP should address how the following requirements are to be met:
- 1. Staffing (perhaps for 24 hours a day, 7 days per week, during the initial response period);
 - 2. Communications equipment (telephones, facsimile, Internet, etc.);
 - 3. Documentation requirements, maintenance of emergency activity logs;
 - 4. Impounding related company records;
 - 5. Office furnishings and supplies; and
 - 6. Reference documents (such as emergency response checklists and procedures, company manuals, aerodrome emergency plans and telephone lists).

The services of a crisis centre may be contracted from an airline or other specialist organisation to look after the service provider's interests in a crisis

away from home base. Company personnel would normally supplement such a contracted centre as soon as possible.

7. *Records.* In addition to the organisation's need to maintain logs of events and activities, the organisation will also be required to provide information to any State investigation team. The ERP should address the following types of information required by investigators:
 - a) All relevant records about the product or service concerned;
 - b) Lists of points of contact and any personnel associated with the occurrence;
 - c) Notes of any interviews (and statements) with anyone associated with the event;
 - d) Any photographic or other evidence.

8. *Accident site.* For a major accident, representatives from many jurisdictions have legitimate reasons for accessing the site: for example, police; fire fighters; medics; aerodrome authorities; coroners (medical examining officers) to deal with fatalities; State accident investigators; relief agencies such as the Red Cross and even the media. Although coordination of the activities of these stakeholders is the responsibility of the State's police and/or investigating authority, the service provider should clarify the following aspects of activities at the accident site:
 - a) Nominating a senior company representative at the accident site if:
 - at home base;
 - away from home base;
 - offshore or in a foreign State;
 - b) Management of surviving victims;
 - c) The needs of the relatives of victims;
 - d) Security of the wreckage;
 - e) Handling of human remains and personal property of the deceased;
 - f) Preservation of evidence;
 - g) Provision of assistance (as required) to the investigation authorities;
 - h) Removal and disposal of the wreckage; etc.

9. *News media.* How the company responds to the media may affect how well the company recovers from the event. Clear direction is required regarding, for example:
 - a) what information is protected by statute (FDR data, CVR and ATC recordings, witness
 - b) statements, etc.);
 - c) who may speak on behalf of the parent organisation at head office and at the accident site (public

- d) relations manager, chief executive officer or other senior executive, manager, owner);
 - e) prepared statements for immediate response to media queries;
 - f) what information may be released (what should be avoided);
 - g) the timing and content of the company's initial statement;
 - h) provisions for regular updates to the media.
10. *Formal investigations.* Guidance for company personnel dealing with State accident investigators and police should be provided.
11. *Family assistance.* The ERP should also include guidance on the organisation's approach to assisting crisis victims or customer organisations. This guidance may include such things as:
- a) State requirements for the provision of assistance services;
 - b) Travel and accommodation arrangements to visit the crisis site;
 - c) Program coordinator and point(s) of contact for victims/customers;
 - d) provision of up-to-date information;
 - e) Temporary assistance to victims or customers.
12. *Post-occurrence review.* Direction should be provided to ensure that, following the emergency, key personnel carry out a full debrief and record all significant lessons learned which may result in amendments to the ERP and associated procedures.

Checklists

Everyone involved in the initial response to a major aviation event will be suffering from some degree of disorientation. Therefore, the emergency response process lends itself to the use of checklists. These checklists can form an integral part of the company's operations manual or emergency response manual. To be effective, checklists must be regularly:

- a) Reviewed and updated (for example, currency of call-out lists and contact details); and
- b) Tested through realistic exercises.

Training and exercises

An ERP is a paper indication of intent. Hopefully, much of an ERP will never be tested under actual conditions. Training is required to ensure that these intentions are backed by operational capabilities. Since training has a short "shelf life", regular drills and exercises are advisable. Some portions of the ERP, such as the call-out and communications plan, can be tested by "desktop" exercises. Other aspects, such as "on-site" activities involving other agencies, need to be exercised at regular intervals. Such exercises have the advantage of demonstrating deficiencies in the plan, which

can be rectified before an actual emergency. For aerodrome operators, the periodic testing of the adequacy of the plan and the conduct of a full-scale emergency exercise are mandatory.

3.5 SMS documentation

The SMS documentation should include a top-level description (exposition) document, which describes the organisation's SMS according to its components and elements. Such a document facilitates the organisation's internal administration, communication and maintenance of the SMS. At the same time, it serves as the organisation's SMS communication (declaration) to the CAA for the purpose of regulatory acceptance, assessment and subsequent oversight of the SMS. This top-level SMS document may be a stand-alone document or it can be a distinct "SMS section/chapter" within an existing organisation or CAA approved document. Where details of the organisation's SMS processes are already addressed in existing documents, appropriate cross referencing to such documents is sufficient. This SMS document will need to be kept up to date, and where significant amendments are intended or made, they may require CAA concurrence where necessary. Guidance for the compilation of an SMS document is in Appendix 1.

Documentation for a SMS should be appropriate to the size, nature, and complexity of the organisation and normally consists of:

- a) SMS records (hazard logs, risk assessments, safety cases, meeting minutes, for example);
- b) Records and documentation management;
- c) SMS manual.

The organisation's SMS manual is the key instrument for communicating the approach to safety for the whole of the organisation. It 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 various SMS components and their relevant integration should be adequately and systematically documented. In the case of Aerodrome Operators, where the SMS manual is a standalone document, appropriate reference should be made to it in the relevant Aerodrome Services and Operations Manual.

It is necessary that the organisation maintain a systematic record of all measures taken to fulfil the objectives and activities of the SMS. Such records would be required as evidence of ongoing SMS processes including hazard identification, risks mitigation and safety performance monitoring. These records should be

appropriately centralised and maintained in sufficient detail to ensure traceability of all safety related decisions. Examples of such records include:

The SMS documentation covers all elements and processes of the SMS and normally includes:

- a) a consolidated description of the SMS components and elements such as:
 - 1) document and records management;
 - 2) regulatory SMS requirements;
 - 3) framework, scope and integration;
 - 4) safety policy and safety objectives;
 - 5) safety accountabilities and key personnel;
 - 6) voluntary hazard reporting system;
 - 7) incident reporting and investigation procedures;
 - 8) hazard identification and risk assessment processes;
 - 9) safety performance indicators;
 - 10) safety training and communication;
 - 11) continuous improvement and SMS audit;
 - 12) management of change; and
 - 13) emergency or operations contingency planning;

- b) a compilation of current SMS related records and documents such as:
 - 1) hazards report register and samples of actual reports;
 - 2) safety performance indicators and related charts;
 - 3) record of completed or in-progress safety assessments;
 - 4) SMS internal review or audit records;
 - 5) safety promotion records;
 - 6) personnel SMS/safety training records;
 - 7) SMS/safety committee meeting minutes; and
 - 8) SMS implementation plan (during implementation process).

Chapter 4 - Safety risk management

Note: Regarding risk assessment and mitigation processes and procedures in ANS domain, such as risk assessment matrix and severity definitions the specific actual CAA/ANS legislation/regulation, TP 12, TP 13, TP 14 and TP 15 shall be consulted.

4.1. General

The safety risk management component of a SMS can be divided into three areas:

- 1) Hazard identification processes;
- 2) Risk assessment and mitigation processes;
- 3) Internal safety investigation.

Safety risk management is the heart of the SMS. The 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 an acceptable level. Mitigation measures should then be monitored to ensure that they have had the desired effect. It is important to apply a common standard and process for risk assessment and control throughout the organisation. Appropriate training and communication will enable a clear understanding on how to deliver this.

The safety risk management process is illustrated in Figure 1.

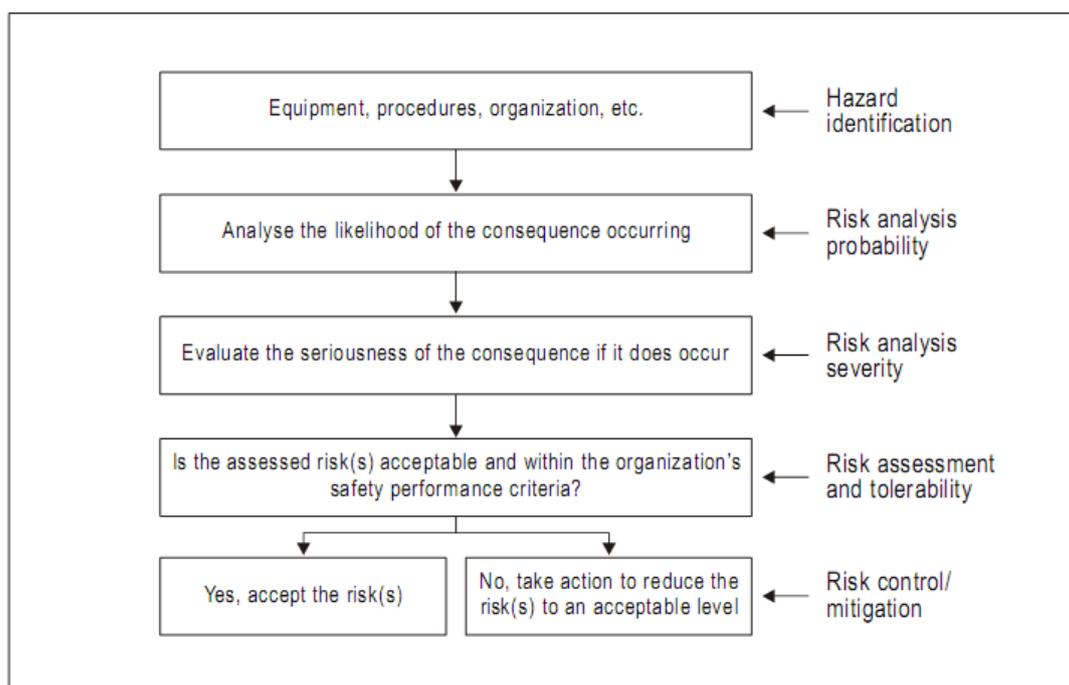


Figure 1. The safety risk management process

4.2. Hazard identification

A hazard is any condition or object that can cause or contribute to an aircraft incident or accident. A hazard identification process enables the collecting, recording, analysing, acting on and generating feedback about hazards that affect the safety of the operational activities of the organisation. In a mature SMS, hazard identification is an ongoing process.

Organisations need to manage safety by making sure that hazards and their associated risks, in critical activities related to the services it provides, are controlled to an acceptable level. Risks cannot be totally eliminated and the implementation of risk management processes is critical to an effective safety management programme. Hazard identification is part of the risk management process. Hazard identification is a process where organisational hazards are identified and managed so that safety is not compromised. Organisations may utilise a range of processes to identify hazards that are likely to jeopardise its operations or weaken its safety defences.

The scope for hazards in aviation is wide, and may be related to:

- *Design factors*, such as equipment and task design;
- *Procedures and operating practices*, such as documentation and checklists;
- *Communications*, such as language proficiency and terminology;
- *Organisational factors*, such as company policies for recruitment, training, remuneration and allocation of resources;
- *Work environment factors*, such as ambient noise and vibration, temperature, lighting, protective equipment and clothing;
- *Defences*, such as detection and warning systems, and the extent to which the equipment is resilient against errors and failures;
- *Human factors*, such as medical conditions, circadian rhythms and physical limitations;
- *Regulatory factors*, such as the applicability of regulations and the certification of equipment, personnel and procedures.

Hazards may be identified from the organisation's reactive, proactive and predictive processes. This should include the company's voluntary reporting system, audits and surveys, accident/incident reports as well as industry incident/accident reports.

Examples of the internal hazard identification data sources include:

- a) Normal operation monitoring schemes;
- b) Voluntary and mandatory reporting systems;
- c) Safety surveys;
- d) Safety audits;
- e) Feedback from trainings; and
- f) Investigation and follow-up reports on accidents/incidents.

Examples of external data sources for hazard identification include:

- a) Industry accident reports;
- b) State mandatory incident reporting systems;
- c) State voluntary incident reporting systems;
- d) State oversight audits; and
- e) Information exchange systems.

The hazard identification and reporting process should be open to all employees. It may be done through formal as well as informal processes. It may be performed at any time as well as under specific conditions. Specific conditions would include:

- When there is an unexplained increase in safety-related events or infractions;
- When there are abnormal audit or safety indicator trends;
- When major operational changes are planned;
- Before a new project, major equipment or facility is set up;
- During a period of significant organisational change, etc.

Figure 2 illustrates the hazard documentation and follow-up risk management process. Hazards are constantly identified through various data sources. Service providers are expected to identify hazards, eliminate these hazards or to mitigate the associated risks. In the case of hazards identified in products or services delivered through subcontractors, mitigation could be the aerodrome operator’s requirement for such organisations to have an SMS or an equivalent process for hazard identification and risk management.

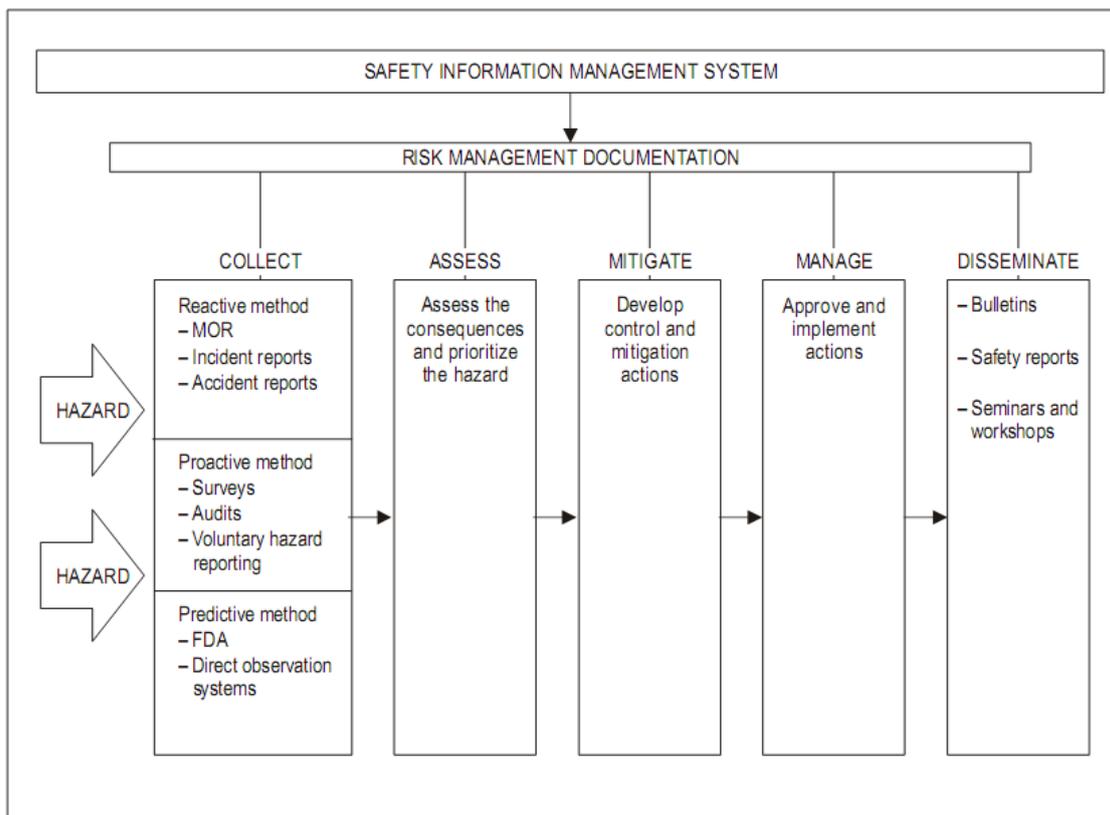


Figure 2. Hazard documentation and follow-up risk management process

4.3. Safety risk assessment and mitigation

4.3.1. Risk

Risk is generally assessed in terms of severity and likelihood of the consequences of a hazard occurring. Organisations should define whether they are assessing severity using the worst case scenario or the most credible outcome. The risk assessment should include appropriate justification and details of any assumptions made. A hazard has the potential to cause harm while risk is the likelihood of that harm occurring 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:

Severity: How bad will it be if the unwanted safety event occurs?

Probability: How likely is the unwanted safety event to occur or reoccur?

Risk assessment and mitigation processes analyse and eliminate or mitigate to an acceptable level, risks that could threaten the capability of an organisation to undertake its activities in a safe manner.

Organisations may use barrier models such as bow-tie for their risk management process.

Figure 3 presents the safety risk management process in its entirety. The process starts with the identification of hazards and their potential consequences. The safety risks are then assessed in terms of probability and severity, to define the level of safety risk (safety risk index). If the assessed safety risks are deemed to be tolerable, appropriate action is taken and the operation continues. The completed hazard identification and safety risk assessment and mitigation process is documented and approved as appropriate and forms part of the safety information management system.

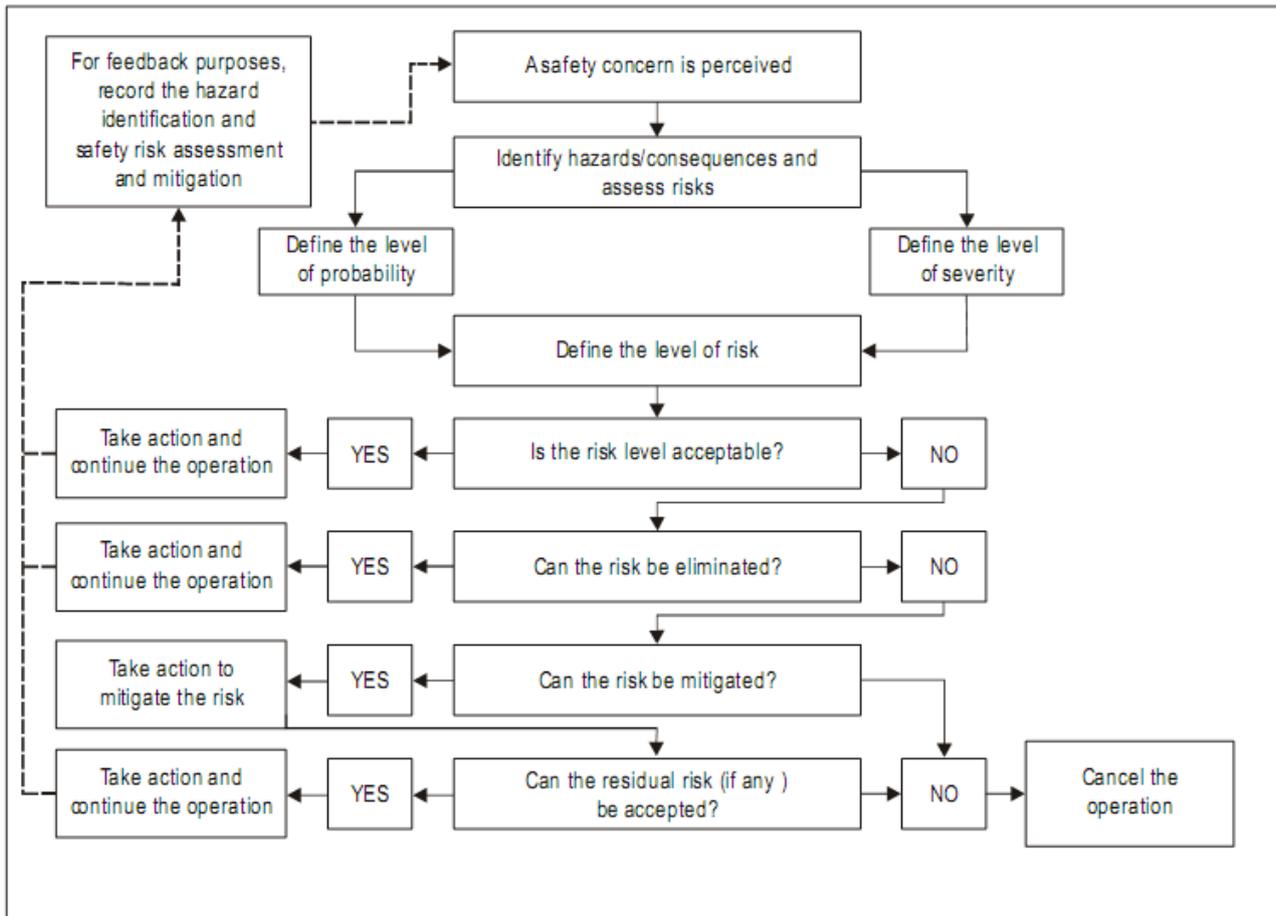


Figure 3. The safety risk management process

A system should be developed for assessing and analysing the data collected or derived from the actions outlined above. Information provided by the analysis should be distributed to those with a responsibility for operational safety in the organisation.

4.3.2. Risk assessment

The risk assessment process should determine the acceptability of a risk. This is normally done by defining a safety risk (index) assessment matrix that should be used across the whole organisation. An example of a safety risk (index) assessment matrix and its definitions is provided below. While the severity of the consequences can be defined, the likelihood of occurrence may be more subjective where data is limited. The assessment process should be recorded at each stage including any assumptions made or supporting information. As risk assessments can be subjective they should be verified by at least one other person or by one of the safety committees.

Severity of consequences

Risk severity measures the possible consequences of a situation of danger, taking as reference the worst foreseeable situation. Severity may be defined in terms of property, health, finance, liability, people, environment, image, or public confidence. Certain questions may be used to guide the assessment of severity, such as:

- How many lives are at risk (e.g. employees, passengers, bystanders, general public)?
- What is the environmental impact (e.g. spillage of fuel or other hazardous products, physical disruption of natural habitats)?
- What is the severity of property, financial damage (e.g. direct asset loss; damage to aviation infrastructure, third party damage, financial impact and economic impact for the State)?
- What is the damage to the organisation's reputation?

Figure 4 below shows a sample risk severity table.

Severity	Meaning	Value
Catastrophic	— Aircraft/Equipment destroyed — Multiple deaths	A
Hazardous	— A large reduction in safety margins, physical distress or a workload such that the operators cannot be relied upon to perform their tasks accurately or completely — Serious injury or death to a number of people — Major equipment damage	B
Major	— A significant reduction in safety margins, a reduction in the ability of the organisation/operator to cope with adverse operating conditions as a result of an increase in workload or as a result of conditions impairing their efficiency — Serious incident — Injury to persons	C
Minor	— Nuisance — Operating limitations — Use of emergency procedures — Minor incident	D
Negligible	— Few consequences	E

Figure 4.Safety risk severity table

Probability of occurrence

Risk Probability is the likelihood that a situation of danger might occur. Certain questions may be used to guide the assessment of probability, such as:

- Is there a history of occurrences similar to the one under consideration, or is this an isolated occurrence?
- What other equipment or components of the same type might have similar defects?

- How many personnel are following, or are subject to, the procedures in question?
- What percentage of the time is the suspect equipment or the questionable procedure in use?
- To what extent are there organisational, managerial or regulatory implications that might reflect larger threats to public safety?

Figure 5 below shows a sample risk probability table. It is sometimes useful to attach logical meanings to the qualitative definition, as illustrated in Table 2.

Likelihood	Meaning	Value
Frequent	Likely to occur many times (has occurred frequently)	5
Occasional	Likely to occur sometimes (has occurred infrequently)	4
Remote	Unlikely to occur, but possible (has occurred rarely)	3
Improbable	Very unlikely to occur (not known to have occurred)	2
Extremely improbable	Almost inconceivable that the event will occur	1

Figure 5.Safety risk probability table

Risk Index

Once the risk Probability and risk Severity values are determined, they will (together) constitute the “Risk Index” for that occurrence. The complete Safety risk assessment matrix is shown in Figure 6. The acceptability (action required) for each risk index is reflected in the safety risk tolerability matrix (Figure 7).

Risk probability	Risk severity				
	Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
Frequent 5	5A	5B	5C	5D	5E
Occasional 4	4A	4B	4C	4D	4E
Remote 3	3A	3B	3C	3D	3E
Improbable 2	2A	2B	2C	2D	2E
Extremely improbable 1	1A	1B	1C	1D	1E

Figure 6.Safety risk assessment matrix

The index obtained from the "safety risk assessment matrix" must then be exported to a safety risk tolerability matrix that describes the tolerability criteria for the particular organisation.

Using the example above, the criterion for safety risk assessed as 4B falls in the "unacceptable under the existing circumstances" category. In this case, the safety risk index of the consequence is unacceptable. The organisation must therefore:

- a) Take measures to reduce the organisation’s exposure to the particular risk, i.e. reduce the likelihood component of the risk index;
- b) Take measures to reduce the severity of consequences related to the hazard, i.e. reduce the severity component of the risk index; or
- c) Cancel the operation if mitigation is not possible.

Note. – The inverted pyramid in Figure 7 reflects a constant effort to drive the risk index towards the bottom APEX of the pyramid. Figure 8 provides an example of an alternate safety risk tolerability matrix.

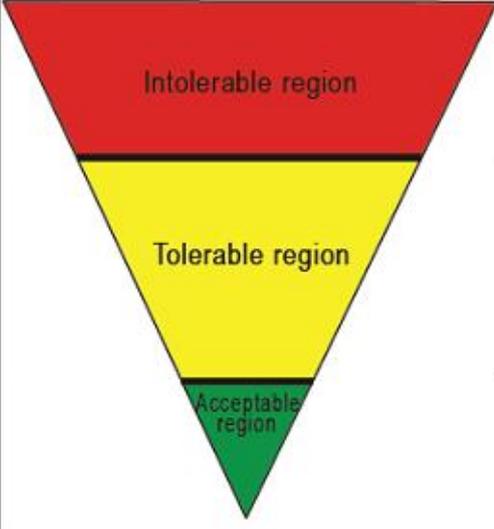
Suggested criteria	Assessment risk index	Suggested criteria
 <p>Intolerable region</p>	<p>5A, 5B, 5C, 4A, 4B, 3A</p>	<p>Unacceptable under the existing circumstances</p>
<p>Tolerable region</p>	<p>5D, 5E, 4C, 4D, 4E, 3B, 3C, 3D, 2A, 2B, 2C</p>	<p>Acceptable based on risk mitigation. It may require management decision.</p>
<p>Acceptable region</p>	<p>3E, 2D, 2E, 1A, 1B, 1C, 1D, 1E</p>	<p>Acceptable</p>

Figure 7. Safety risk tolerability matrix

Risk index range	Description	Recommended action
5A, 5B, 5C, 4A, 4B, 3A	High risk	Cease or cut back operation promptly if necessary. Perform priority risk mitigation to ensure that additional or enhanced preventive controls are put in place to bring down the risk index to the moderate or low range.
5D, 5E, 4C, 4D, 4E, 3B, 3C, 3D, 2A, 2B, 2C, 1A	Moderate risk	Schedule performance of a safety assessment to bring down the risk index to the low range if viable.
3E, 2D, 2E, 1B, 1C, 1D, 1E	Low risk	Acceptable as is. No further risk mitigation required.

Figure 8. An alternate safety risk tolerability matrix

4.3.3. Risk mitigation

Risks should be managed to a tolerable (acceptable) level. This should 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. It is easier and more common to reduce the likelihood than it is to reduce the severity.

A safety risk initially assessed as intolerable may be mitigated and subsequently moved into the tolerable region provided that such risks remain controlled by appropriate mitigation strategies. In both cases, a supplementary cost-benefit analysis may be performed if deemed appropriate.

Corrective action should take into account any existing defences and their inability to achieve an acceptable level of risk. This may result in a review of previous risk assessments that may have been impacted by the corrective action. Risk mitigations and controls will need to be verified/audited to ensure that they are effective.

4.3.4. Cost-benefit analysis (CBA)

During the process of evaluating mitigation actions or additional defences, it is necessary to strike a balance between production and safety goals. Efficient and safe operations or provision of service require a constant balance between production goals and safety goals. Cost-benefit or cost-effectiveness analysis is normally an

independent process from safety risk mitigation or assessment. It is commonly associated with a higher level management protocol, such as a regulatory impact assessment or business expansion project. However, there may be situations where a risk assessment may be at a sufficiently high level or have a significant financial impact. In such situations, a supplementary CBA or cost effectiveness process to support the risk assessment may be warranted. This is to ensure that the cost-effectiveness analysis or justification of recommended mitigation actions or preventive controls has taken into consideration the associated financial implications.

4.3.5. Hazard Identification and Risk Assessment (HIRA) Program

As part of an organisation's SMS implementation plan, there should be a program for systematic hazard identification and risk analysis (HIRA) of its operations and processes which are pertinent to aviation safety. The systematic and progressive performance (and maintenance) of such a program should constitute the primary long term safety objective of an organisation's SMS. Such a program should include a short to medium term target of completing an initial (baseline) HIRA for all eligible operations and processes (as determined by the organisation). Depending on the size and complexity of the organisation, such an initial (baseline) evaluation and safety assessment program may take from several months to a few years to be fully completed.

Organisations with newly acquired equipment or processes may take into consideration OEM (Original Equipment Manufacturer) system design risk analysis data or recommendations during its initial safety assessment. The organisation should also review the interface between such equipment/processes and its own operational environment and internal procedures where applicable. Where there are subsequent (or historical) local modifications or incidents/ accidents attributable to such operations or processes, a review of its initial safety assessment (with respect to the affected area or system) should be accounted for as appropriate.

4.3.6. HIRA Eligible Operations/Processes

During an organisation's initial HIRA program, there will be an apparent need to identify what are the HIRA eligible operations/processes for the organisation. In principle, all operations/processes with the potential to generate hazards/risks to aviation safety should be eligible for HIRA accountability. However, it is prudent that priority be given to the identification of those operations/processes that are deemed by the organisation to be crucial or pertinent to aviation safety. In due course, the HIRA eligibility identification process may then be expanded to cover other lower priority operations/processes. For this purpose, organisations may begin by compiling an inventory (or register) of HIRA eligible operations/processes.

These may be categorized to facilitate HIRA performance prioritization. Following are some examples of what organisations may consider as candidates for their initial/ priority HIRA performance:

- Aerodromes with unusual or special hazard/ risk such as difficult terrain, high traffic density, typhoon prone areas, inefficient apron control, inadequate markings or guidance systems, extreme weather conditions, etc.;
- Other aerodrome operations/processes deemed by the organisation as essential for priority HIRA accountability.

Chapter 5 - Safety assurance

5.1. General

Safety assurance assesses the safety performance of the organisation and enables continuous improvement. Safety assurance consists of processes and activities undertaken by the service provider to determine whether the SMS is operating according to expectations and requirements. The service provider should continually monitor its internal processes as well as its operating environment to detect changes or deviations that may introduce emerging safety risks or the degradation of existing risk controls. Such changes or deviations may then be addressed together with the safety risk management process.

The three aspects of safety assurance are:

- 1) Safety performance monitoring, measurement and review;
- 2) The management of change;
- 3) Continuous improvement of the safety management system.

5.2. Safety performance monitoring and measurement

A key function of the SMS is assurance that the system is working and is effective. This involves:

The setting and monitoring of Safety Performance Indicators (SPIs) to measure the organisation's safety performance;

- a) Assessing the effectiveness of the SMS by confirming that the mitigations, controls and defences put in place are working and effective to ensure safe operational practices;
- b) Monitoring compliance with the appropriate regulations and standards.

Note: These all require safety and quality (compliance monitoring) to be integrated or working closely together.

5.2.1. Safety objectives

Safety objectives need to have been established before setting SPIs. This allows the safety performance of the organisation to be measured against its safety policies and objectives. To assist in their development, safety objectives should be Specific, Measurable, Achievable, Realistic and Timely (S.M.A.R.T.).

The following should be considered in setting safety objectives:

- Define what the organisation hopes to achieve.
- It should be a statement of a desired outcome.

- Safety objectives should be short, high-level statements of the safety priorities and should reflect the organisation's safety policy.
- Safety objectives should address the organisation's most significant risks.

5.2.2. Safety Performance Indicators (SPI)

Safety performance indicators (parameters) are generally data based expressions of the frequency of occurrence of some safety/quality related events, incidents or reports. These occurrence data may be reactive, proactive or predictive in nature. SPIs are used to monitor known safety risks, detect emerging safety risks and to determine any necessary corrective actions. They also provide objective evidence for CAA to assess the effectiveness of the organisation's SMS and to monitor achievement of its safety objectives.

The safety performance indicators and associated targets should be accepted by CAA. There is no single safety performance indicator that is appropriate to all organisations. The indicator(s) chosen should correspond to the organisation's relevant safety objectives or goals.

5.2.3. Safety Performance Monitoring

Safety performance monitoring is the process by which safety indicators of the organisation are reviewed in relation to safety policies and objectives. The performance of each indicator is reviewed with respect to its pre-established minimum acceptable level (alert level) and its safety target (desired level). Such monitoring would normally be done at the safety committee.

Information used to measure the organisation's safety performance is generated through its safety reporting systems.

There are two types of reporting systems:

- 1) Mandatory incident reporting systems; and
- 2) Voluntary incident reporting systems.

Other sources of safety information to support safety performance monitoring and measurement may include:

- Safety studies;
- Safety reviews;
- Safety surveys;
- Audits;
- Internal investigations.

5.2.4. Safety Reporting

An effective way to promote safe operations is to ensure that an organisation has developed an environment where all staff feels responsible for safety. This becomes evident when staff considers the impact on safety in everything they do, report all hazards, errors and threats and support the identification and management of all their associated risks. In addition, management must create an environment in which personnel are aware of safety risks, are given sufficient systems to protect themselves and are assured protection when they divulge safety information through the safety reporting system. An effective safety culture serves as a method to synchronize diverse national and professional cultures within the context of the organisation.

Two main types of reporting systems are:

- 1) Mandatory incident reporting systems; and
- 2) Voluntary incident reporting systems.

Mandatory incident reporting systems require the reporting of certain types of events (e.g. serious incidents, runway incursions). This requires implementation of the CAA regulation on occurrence reporting in civil aviation, identifying the reporting criteria and scope of reportable occurrences. Mandatory reporting systems tend to collect more information related to high-consequence technical failures than other aspects of operational activities.

Voluntary reporting systems allow for the submission of information related to observed hazards or inadvertent errors without an associated legal or administrative requirement to do so. In these systems, organisations may offer an incentive to report. For example, enforcement action may be waived for reports of inadvertent errors or unintentional violations. Under these circumstances, reported information should be used solely to support the enhancement of safety. Such systems are considered “non-punitive” because they afford protection to reporters thereby ensuring the continued availability of such information to support continuous improvements in safety performance. While the nature and extent of service providers’ non-punitive policies may vary, the intent is to promote an effective reporting culture and proactive identification of potential safety deficiencies.

Staff needs to have confidence in the reporting system. They must know that confidentiality will be maintained and that the information they submit will be acted upon, otherwise they will decide that there is no benefit in their reporting.

5.2.5. Other sources of safety information

Safety studies are analyses used to gain an understanding of broad safety issues or those of a global nature. For example, the airline industry may produce safety

recommendations and implement measures to reduce accidents and incidents during the approach and landing phases. Individual service providers may find that these global recommendations improve safety performance in the context of their aviation activities.

Safety reviews are a fundamental component of change management. They are conducted during the introduction of new technologies, new procedures or systemic changes that affect aviation operations. Safety reviews have a clearly defined objective that is linked to the change under consideration. Safety reviews ensure that safety performance is maintained at appropriate levels during periods of change.

Safety surveys examine procedures or processes related to a specific operation. Generally, they provide qualitative information that may require validation to determine appropriate corrective action. Nonetheless, surveys may provide an inexpensive source of significant safety information.

Safety surveys should be carried out as a matter of routine, to provide assurance to managers of safe operational activity. They are used to identify issues or problems in daily operations. They can also be used to gather the views and opinions of operational personnel. Surveys may involve the use of:

- a) Day to day observation checks;
- b) Questionnaires;
- c) Informal confidential interviews.

Safety surveys allow an organisation to identify behaviours and attitudes of staff. This may identify human conditions that can impact an organisation's safety performance. Survey information is subjective and should therefore be verified before any corrective action is initiated but may provide a valuable source of safety information.

Audits focus on the integrity of the organisation's SMS and its supporting systems. Audits provide an assessment of safety risk controls and related quality assurance processes. Audits may be conducted by entities that are external to the service provider or through an internal audit process having the necessary policies and procedures to ensure its independence and objectivity.

Audits are intended to provide assurance of the safety management functions, including:

- 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.

Internal investigations are conducted for certain reportable safety events in accordance with internal or regulatory requirements. They should also include occurrences that are not required to be reported to the CAA. Though often of a minor nature, they could be indicative of a potential hazard or trend that would only be revealed through systematic investigation and data analysis. Ideally, they should be undertaken by trained investigators.

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.

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 should include:

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

An organisation should have procedures to communicate the results of any safety investigations and where appropriate to address any identified hazards. This should include incorporating lessons learnt into procedures, training and safety promotion.

5.3. The management of change

Aviation organisations experience constant change due to expansion and introduction of new equipment or procedures. Changes can introduce new hazards or risks which can impact the appropriateness or effectiveness of previous risk mitigation. External changes would include change of regulatory requirements, security status/level or re-arrangement of air traffic control/provisions, etc. Internal changes can involve management/organisational changes, major new equipment introduction or new procedures, etc.

A formal management of change process shall be developed and maintained to identify changes within or from outside the organisation which may affect established processes and services from a safety viewpoint. Prior to implementing such changes, the new arrangements should be assessed using the SMS hazard and risk analysis protocol. Activities with safety risks should be scheduled for a baseline hazard analysis in accordance with the organisation's HIRA program.

Periodically, such activities should be reviewed for any changes to the operational environment which may affect the continued validity of the previous baseline analysis. The procedure for routine review of completed safety assessments should be established as appropriate. The interval for such scheduled review may be on a case by case basis or as a standard interval, for example annually. Such scheduled review may take into consideration previously unidentified hazard/risks based on operational or industry incident/accident investigation findings. Likewise, any modification or change subsequent to the initial safety assessment done should be evaluated for any possible effect on the existing safety assessment.

Organisations should define the types of changes that would require a formal management of change process. This should also include who makes the decision to start the process and who has the authority to sign it off. A detailed guidance for those who are involved in any development or physical change in aerodrome may be found in Technical Publication – TP 08 Aerodrome Development.

5.4. Continuous improvement of the SMS

The organisation should continually seek to improve their safety performance. They shall monitor and assess the effectiveness of its SMS processes to enable continuous improvement of the overall performance of the SMS.

Continuous improvement is measured through the monitoring of an organisation's safety performance indicators and is related to the maturity and effectiveness of an SMS. Safety assurance processes support improvements to the SMS through continual verification and follow-up actions. These objectives are achieved through the application of internal evaluations and independent audits of the SMS.

Continuous improvement of overall performance of the SMS should be achieved through:

- a) Proactive evaluation of day to day operations, facilities, equipment, documentation and procedures through safety audits and surveys. It is here where the key activity of SMS – hazard identification and risk mitigation (HIRM) takes place;
- b) Evaluation of an individual's performance to verify the fulfilment 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 organisational changes to ensure that they are effective.
- e) Regular review of the organisation's safety performance and safety action plans.

5.4.1. Internal SMS Audit

Internal safety (SMS) audits are used to ensure that the structure of an SMS is sound. It is also a formal process to ensure continuous improvement and effectiveness of the SMS. The protocol for conducting a SMS audit (from planning to final corrective action closure) should be no different from any other system audit. Audits should involve the use of appropriate checklists. The overall scope of an SMS audit should include:

- a) Regulatory SMS requirements;
- b) Structure of safety accountabilities;
- c) Organisational safety policies and standards;
- d) Documentation, including SMS manual and SMS records;
- e) Compliance with SMS hazard/risk evaluation procedures;
- f) Adequacy of staff training for their SMS roles;
- g) Performance indicators and Acceptable Level of Safety;
- h) Compliance with safety assessment plan or schedule;
- i) Effective SMS integration with other control systems;
- j) SMS integration with contractors where applicable;
- k) Continuing assessments and management of change;
- l) Review completed safety assessments for any that may be obviously sub-standard or inadequate.

5.4.2. Safety Reviews

Over and above SMS audits, safety reviews or surveys may be employed as a proactive procedure for examining particular elements, processes or a specific operation for any safety concerns or sub-standard performance. Such targeted safety surveys may be initiated as a follow up to informal feedback or voluntary/confidential reports to identify issues that may contribute to generation of hazard/risks or their escalation factors, such as:

- Problem areas or bottlenecks in daily operations;
- Perceptions and opinions about personnel's competency with possible safety implications;
- Poor teamwork and cooperation between employee groups or departments (especially involving safety/operational/technical functions);
- Areas of dissent or perceived confusion (especially involving safety/operational/technical functions);
- Unsafe working procedures or conditions;
- Prolonged working hours or long-term manpower shortfall, etc.

Chapter 6 - Safety promotion

6.1. General

Safety promotion encourages a positive safety culture and creates an environment that is conducive to the achievement of the organisation's safety objectives. A positive safety culture is characterized by values, attitudes and behaviour that are committed to the organisation's safety efforts. This is achieved through the combination of technical competence that is continually enhanced through training, and education, effective communications and information sharing. Senior management provides the leadership to promote the safety culture throughout the organisation.

Safety promotion affects both individual and organisational behaviour and supplements the organisation's policies, procedures and processes, providing a value system that supports safety efforts.

Service providers must establish and implement processes and procedures that facilitate effective communication throughout all levels of the organisation. They should communicate their safety objectives, as well as the current status of any related activities and events. Organisations must also encourage "bottom-up" communication, providing an environment that allows senior management to receive open and constructive feedback from operational personnel.

6.2. Training and education

All staff should receive safety training as appropriate for their safety roles and responsibilities. In particular, all operational staff, managers, supervisors, senior managers and the Accountable executive 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 behaviours for all levels of staff in the organisation.

The organisation shall develop and maintain a safety training programme that ensures that personnel are trained and competent to perform their SMS duties. The scope of the safety training programme shall be appropriate to each individual's involvement in the SMS and in compliance with all international and CAA requirements.

This training programme should involve initial training as well as continued maintenance of competence.

The procedure for safety training and education should include the following, where applicable:

- a) A documented process to identify training requirements;
- b) A validation process that measures the effectiveness of training;
- c) Initial general/ job-specific safety training;
- d) Initial training incorporating SMS, Human Factors and organisational factors;
- e) Recurrent safety training as applicable.

The safety manager should, in conjunction with the personnel department or functional heads, review the job descriptions of all staff, and identify those positions that have safety responsibilities. These should include operational personnel, managers/supervisors, senior managers and the Accountable executive. This is to ensure that relevant personnel are trained and competent to perform their SMS duties. The level/mode of training should be appropriate to the individual's involvement in the SMS. Following is an example of the scope of SMS training:

Operations/Support Personnel

- a) Organisational safety policy, goals and objectives;
- b) SMS fundamentals including definition of hazards, consequences and risks, safety risk management process
- c) Roles and responsibilities
- d) Safety reporting and the organisation's safety reporting system

Managers and Supervisors

- a) All the above
- b) Safety Responsibilities in promoting the SMS and engaging operational personnel in hazard reporting
- c) Knowledge of safety process, HIRA and change management
- d) Safety data analysis

Senior Managers

- a) All the above
- b) Safety assurance and safety promotion
- c) Safety roles and responsibilities
- d) Acceptable Level of Safety indicators

Accountable executive

- a) General awareness of the organisation's SMS, including SMS roles and responsibilities, safety policy and objectives, safety risk management and safety assurance
- b) Knowledge of SMS principals

SMS Manager

- a) Should attend a formal comprehensive aviation SMS training course.

- b) Be familiar with relevant SMS regulations and ICAO SMS guidance materials

Training requirements consistent with the needs and complexity of the organisation should be documented for each area of activity. A training file should be developed for each employee, including management.

6.3. Safety communication

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

- a) Dissemination of the SMS manual;
- b) Safety processes and procedures;
- c) Safety newsletters, notices and bulletins;
- d) Websites or email, and
- e) Informal meetings between staff and the senior managers.

Safety communication should:

- a) Ensure that staff are fully aware of the SMS;
- b) Convey safety-critical information;
- c) Raise awareness of corrective actions;
- d) Provide information regarding new or amended safety procedures; and
- e) Complement and enhance the organisation's safety culture.

Chapter 7 - Gap analysis and SMS implementation plan

7.1. Gap analysis

It is apparent that organisations would need to conduct a gap analysis of their system(s) to determine which components and elements of a safety management system are currently in place and which components or elements must be added or modified to meet SMS as well as regulatory requirements. The gap analysis facilitates development of an SMS implementation plan by identifying the gaps that must be addressed to fully implement an SMS. Once the gap analysis has been completed and fully documented, the resources and processes that have been identified as missing or inadequate will form the basis of the SMS implementation plan.

7.2. SMS implementation plan

An SMS implementation plan is developed in consultation with the Accountable executive and managers responsible for the delivery of services related to, or in support of, the safe operation of the organisation. Once completed, the Accountable executive endorses the plan. The SMS implementation plan includes timelines and milestones consistent with the requirements identified in the gap analysis process, the size of the service provider and the complexity of its products or services. The plan should address coordination with external organisations or contractors where applicable.

The service provider's implementation plan may be documented in different forms, varying from a simple spreadsheet to specialized project management software. The implementation plan should address gaps through completion of specific actions and milestones according to the stated timeline. Assignment of each task assures accountability throughout the implementation process. The plan should be reviewed regularly and updated as necessary.

Full implementation of all components and elements of the SMS framework may take up to five years, depending on an organisation's maturity and complexity.

APPENDIX 1 - Guidance for the development of a Safety Management System manual for Aerodrome Operators

1. General

This appendix serves to guide organisations in their compilation of a top-level SMS manual (or document) to define their SMS framework and its associated elements. The manual can be a stand-alone SMS manual or be integrated as a consolidated SMS section/chapter within an appropriate approved manual of the organisation (e.g. the organisation's exposition manual or company manual). The actual configuration may depend on regulatory expectation.

Remember that small operations will have very basic and simple processes compared to a larger company. The important thing to remember when developing processes that rely on verbal communication is to keep a record of any hazards discussed and decisions made.

2. Format of the SMS Manual

The SMS Manual may be formatted in the following manner:

- a) Section headings with numbering
- b) Objective
- c) Criteria
- d) Cross Reference Documents

Below each numbered "section heading" is a description of the "objective" for that section, followed by its "criteria" and "cross-reference documents". The "objective" is what the organisation intends to achieve by doing what is described in that section. The "criteria" defines the scope of what should be considered when writing that section. The "cross-reference documents" links the information to other relevant manuals or SOPs of the organisation which contain details of the element or process as applicable.

3. Manual Contents

The contents of the manual may include the following sections:

1. Document control;
2. SMS regulatory requirements;
3. Scope and integration of the safety management system;
4. Safety policy;
5. Safety objectives;
6. Safety accountabilities and key personnel;

7. Safety reporting and remedial actions;
8. Hazard identification and risk assessment;
9. Safety performance monitoring and measurement;
10. Safety-related investigations and remedial actions;
11. Safety training and communication;
12. Continuous improvement and SMS audit;
13. SMS records management;
14. Management of change; and
15. Emergency/contingency response plan.

Below is an example of the type of information that could be included in each section using the format prescribed in Chapter 2.

1. Document Control

Objective:

Describe how the manual(s) will be kept up to date and how the organisation will ensure that all personnel involved in safety-related duties have the most current version.

Criteria:

- a) Hard copy or controlled electronic media and distribution list.
- b) The correlation between the SMS manual and other existing manuals such as the maintenance control manual (MCM) or the operations manual.
- c) The process for periodic review of the manual and its related forms/documents to ensure their
- d) continuing suitability, adequacy and effectiveness.
- e) The manual's administration, approval and regulatory acceptance process.

Cross-reference documents

Quality manual, engineering manual, etc.

2. SMS Regulatory Requirements

Objective

Address current SMS regulations and guidance material for necessary reference and awareness by all concerned.

Criteria

- a) Spell out the current SMS regulations/standards. Include the compliance timeframe and advisory
- b) material references as applicable.
- c) Where appropriate, elaborate on or explain the significance and implications of the regulations to
- d) the organisation.
- e) Establish a correlation with other safety-related requirements or standards where appropriate.

Cross-reference documents

SMS regulation/requirement references, SMS guidance document references, etc.

3. Scope and Integration of the Safety Management System

Objective

Describe the scope and extent of the organisation's aviation-related operations and facilities within which the SMS will apply. The scope of the processes, equipment and operations deemed eligible for the organisation's hazard identification and risk management (HIRM) programme should also be addressed.

Criteria

- a) Spell out nature of the organisation's aviation business and its position or role within the industry as a whole.
- b) Identify the major areas, departments, workshops, facilities, capabilities and other relevant aspects of the organisation within which the SMS will apply.
- c) Identify the scope of all relevant processes, operations and equipment which are deemed to be eligible for the organisation's HIRA evaluation program; especially those which are pertinent to aviation safety. If the scope of HIRA eligible process, operations and equipment is too detailed or extensive, it may be controlled under a supplementary document as appropriate.
- d) Where the SMS is expected to be operated or administered across a group of interlinked organisations or contractors, such integration and associated accountabilities should be defined and documented as applicable.
- e) Where there are other related control/management systems within the organisation such as Quality Management System (QMS), Occupational Safety, Health and Environment (OSHE) and Security Management System (SeMS) identify, their relevant integration (where applicable) within the aviation SMS.

Cross-reference documents

Quality manual, engineering manual, etc.

4. Safety Policy

Objective

Describe the organisation's intentions, management principles, and commitment to improving aviation safety in the company. A safety policy should be a short description similar to a mission statement.

Criteria

- a) The safety policy should be appropriate to the size and complexity of the organisation.
- b) The safety policy states the organisation's intentions, management principles and commitment to continuous improvement in the aviation safety level.
- c) The safety policy is approved by the Accountable executive.
- d) The safety policy is promoted by the Accountable executive.
- e) The safety policy is reviewed periodically.
- f) Personnel at all levels are involved in the establishment and maintenance of the safety management system.
- g) The safety policy is communicated to all employees with the intent that they are made aware of their individual safety obligations.

Cross-reference documents

OSHE safety policy, etc.

5. Safety Objectives

Objective

Describe the safety objectives of the organisation. The safety objectives should be a short statement that describes in broad terms what the organisation hopes to achieve.

Criteria:

- a) The safety objectives have been established.
- b) The safety objectives are expressed as a top-level statement describing the organisation's commitment to achieving safety.
- c) There is a formal process to develop a coherent set of safety objectives.
- d) The safety objectives are publicized and distributed.
- e) Resources have been allocated for achieving the objectives
- f) The safety objectives are linked to safety indicators to facilitate monitoring and measurement where appropriate.

Cross-reference documents

Safety performance indicators document, etc.

6. Roles and responsibilities

Objective

Describe the safety authorities, responsibilities and accountabilities for personnel involved in the SMS.

Criteria

- a) The Accountable executive is responsible for ensuring that the safety management system is properly implemented and performing to requirements in all areas of the organisation.
- b) Appropriate Safety Manager (office) and Safety Committee have been appointed as appropriate.
- c) Safety authorities, responsibilities and accountabilities of personnel at all levels of the organisation are defined and documented.
- d) Safety authorities, responsibilities and accountabilities are promulgated to all personnel in key documentation and communication media.
- e) All personnel understand their authorities, responsibilities and accountabilities in regards to all safety management processes, decision and actions.
- f) An SMS organisational accountabilities chart is available.

Cross-reference documents

Company exposition manual, SOP manual, administration manual, etc.

7. Safety reporting

Objective

A reporting system should include both reactive (accident/incident reports, etc.) and proactive/ predictive (hazard reports). Describe the respective reporting systems. Factors to consider include: report format, policy under which employees are encouraged to report errors, safety deficiencies, hazards, accidents, and incidents (confidentiality), addressees, investigation/evaluation procedures, corrective/preventive actions and report dissemination.

Criteria

- a) The organisation has a procedure that provides for the capture of internal occurrences including accidents, incidents and other occurrences relevant to SMS.
- b) A distinction is to be made between mandatory reports (accidents, serious incidents, major defects, etc.), which are required to be notified to the CAA, and other routine occurrence reports, which remain within the organisation.
- c) There is also a voluntary and confidential hazard/occurrence reporting system, incorporating appropriate identity/ data protection as applicable.
- d) The respective reporting processes are simple, accessible and commensurate with the size of the organisation.
- e) High-consequence reports and associated recommendations are addressed to and reviewed by the appropriate level of management.
- f) Reports are collected in an appropriate database to facilitate the necessary analysis.

Cross-reference documents

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8. Hazard Identification and Risk Assessment (HIRA)

Objective

Describe your hazard identification system and related schemes and how such data are collated. Describe your process for any categorization of hazards/risks and their subsequent prioritization for a documented safety assessment. Describe how your safety assessment process is conducted and how preventive action plans are implemented.

Criteria:

- a) Identified hazards are evaluated, prioritized and processed for risk assessment as appropriate.
- b) There is a structured process for the assessment of risks associated with identified hazards, expressed in terms of consequence (severity) and likelihood (probability of occurrence)
- c) Hazard identification and risk analysis procedures do manifest aviation safety as its fundamental context.
- d) There is a criterion for evaluating risk and the tolerable level of risk the organisation is willing to accept together with any mitigating factors.
- e) The organisation has risk control strategies that include corrective, preventive and recovery action plans.
- f) Corrective, preventive and recovery actions, including timelines, are documented and approved by appropriate level of management.

- g) The organisation has a process for evaluating and updating the effectiveness of the corrective, preventive and recovery measures that have been developed.
- h) There is a process for periodic review of completed safety assessments and documenting their outcomes.

Cross-reference documents
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9. Safety performance monitoring and measurement

Objective

Describe the safety performance monitoring and measurement component of the SMS. This includes the organisation's SMS safety performance indicators (SPIs).

Criteria

- a) The formal process to develop and maintain a set of safety performance indicators and their associated performance targets.
- b) Correlation established between the SPIs and the organisation's safety objectives where applicable and the process of regulatory acceptance of the SPIs where required.
- c) The process of monitoring the performance of these SPIs including remedial action procedure whenever unacceptable or abnormal trends are triggered.
- d) Any other supplementary SMS or safety performance monitoring and measurement criteria or process.

Cross-reference documents
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10. Safety-related investigations and remedial actions

Objective:

Describe how accidents/incidents/occurrences are investigated and processed within the organisation, including their correlation with the organisation's SMS hazard identification and risk management system.

Criteria

- a) Procedures to ensure that reported accidents and incidents are investigated internally.

- b) Dissemination of completed investigation reports internally as well as to the CAA as applicable.
- c) A process for ensuring that corrective actions taken or recommended are carried out and for evaluating their outcomes/effectiveness.
- d) Procedure on disciplinary inquiry and actions associated with investigation report outcomes.
- e) Clearly defined conditions under which punitive disciplinary action would be considered (e.g. illegal activity, recklessness, gross negligence or wilful misconduct).
- f) A process to ensure that investigations include identification of active failures as well as contributing factors and hazards.
- g) Investigation procedure and format provides for findings on contributing factors or hazards to be processed for follow-up action by the organisation's hazard identification and risk management system where appropriate.

Cross-reference documents

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11. Safety Training and Communication

Objective

Describe the type of SMS and other safety-related training that staff receive and the process for assuring the effectiveness of the training. Describe how such training procedures are documented. Describe the safety communication processes/channels within the organisation.

Criteria

- a) The training syllabus, eligibility and requirements are documented.
- b) There is a validation process that measures the effectiveness of training.
- c) The training includes initial, recurrent and update training, where applicable.
- d) The organisation's SMS training is part of the organisation's overall training programme.
- e) SMS awareness is incorporated into the employment or indoctrination programme.
- f) The safety communication processes/channels within the organisation.

Cross-reference documents

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12. Continuous Improvement and SMS audit

Objective

Describe the process for the continuous review and improvement of the SMS.

Criteria

- a) The process for regular internal audit/review of the organisation's SMS to ensure its continuing suitability, adequacy and effectiveness.
- b) Describe any other programmes contributing to continuous improvement of the organisation's SMS and safety performance, e.g. MEDA, safety surveys, ISO systems.

Cross-reference documents

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13. SMS records management

Objective:

Describe the method of storing all SMS-related records and documents.

Criteria:

- a) The organisation has an SMS records or archiving system that ensures the retention of all records generated in conjunction with the implementation and operation of the SMS.
- b) Records to be kept include hazard reports, risk assessment reports, safety action group/safety meeting notes, safety performance indicator charts, SMS audit reports and SMS training records.
- c) Records should be traceable for all elements of the SMS and be accessible for routine administration of the SMS as well as internal and external audits purposes.

Cross-reference documents

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14. Management of Change

Objective

Describe the organisation's process for managing changes that may have an impact on safety risks and how such processes are integrated with the SMS.

Criteria

- a) Procedures to ensure that substantial organisational or operational changes take into consideration any impact which they may have on existing safety risks.
- b) Procedures to ensure that appropriate safety assessment is performed prior to introduction of new equipment or processes which have safety risk implications.
- c) Procedures for review of existing safety assessments whenever there are changes to the associated process or equipment.

Cross-reference documents

Company SOP relating to management of change, etc.

15. Emergency Response Plan

Objective

Describe the organisation's intentions regarding, and commitment to dealing with, emergency situations and their corresponding recovery controls. Outline the roles and responsibilities of key personnel. The emergency response plan can be a separate document or it can be part of the SMS manual.

Criteria

- a) The organisation has an emergency plan that outlines the roles and responsibilities in the event of a major incident, crisis or accident.
- b) There is a notification process that includes an emergency call list and an internal mobilization process.
- c) The organisation has arrangements with other agencies for aid and the provision of emergency services as applicable.
- d) The organisation has procedures for emergency mode operations where applicable.
- e) There is a procedure for overseeing the welfare of all affected individuals and for notifying next of kin.
- f) The organisation has established procedures for handling the media and insurance-related issues.
- g) There are defined accident investigation responsibilities within the organisation.
- h) The requirement for preservation of evidence, securing the affected area, and mandatory/governmental reporting is clearly stated.
- i) There is emergency preparedness and response training for affected personnel.

- j) A disabled aircraft or equipment evacuation plan has been developed by the organisation in consultation with aircraft/equipment owners, aerodrome operators or other agencies as applicable.
- k) A procedure exists for recording activities during an emergency response.

Cross-reference documents

ERP manual, etc.

APPENDIX 2 – Safety Management System review checklist for Aerodrome Operators

A SMS checklist has been prepared as guidance material only to assist aerodrome Safety Managers while conducting a review of the SMS documentation and preparation of review reports.

This checklist is generic. A checklist questionnaire should be relevant to each specific aerodrome situation and therefore the Safety Manager may need to add additional questions to the checklist.

The checklist could also be used as a “gap analysis” pro forma.

Safety Policy and Objectives

- Does the SMS documentation include a policy statement endorsed by the Accountable executive?
- Does the policy include the aim of achieving improved hazard identification and more effective risk management of associated risks?
- Does the SMS manual contain a list of safety objectives?
- Are the objectives measurable using the aerodromes stated safety assurance methods?
- Has a Safety Manager been appointed?
- Are the Safety Manager’s roles and responsibilities clearly defined?
- Is there a Safety Committee?
- Is there an organisational chart that clearly defines the chain of command and a reporting structure up to the Accountable executive?
- How does the administration section identify the roles and responsibility of senior management participation with SMS?
- Does the policy endorse and confirm the frequency of senior management participation at SMS meetings or other events stated in the SMS documentation?
- Does the documentation identify the stakeholder association and roles and responsibilities of third parties to participate in hazard identification?
- Is there a genuine statement to achieve the highest level of safety compliance accepting due care and diligence?
- Does the documentation identify the importance to continually review the “systems” and is there a formal audit process?

Safety Risk Management

- Has a Risk Management Framework been implemented?
- Is the likelihood and consequence definitions in the aerodrome SMS consistent with the framework?

- Is there a risk matrix or other valid risk analysis tool used?
- If used, is the risk matrix consistent with other internal matrix and project assessment guidelines?
- Are the SMS documentation tools for operations consistent with financial assessment risk management tools?
- Is risk management supported by a risk register?
- Is there a hazard register to record events that have actually occurred?
- Does someone with human factors training assess incidents and events to determine human factors hazards and associated risks?
- Have all projects been assessed prior to commencement to identify potential risk?
- Is the project assessment system clearly documented to support potential change management issues?
- Do the system document procedures assess all reporting capabilities?
- Does the Safety Manager communicate with Aerodrome Reporting Officers and assess serviceability issues?
- Does the SMS clearly define who will be responsible for certain outcomes depending on risk levels?
- Are all personnel responsible for SMS reporting and assessment competent?
- Do the responsible personnel have a sound knowledge of aerodrome operations?

Safety Assurance

- How is the SMS audited?
- Does the aerodrome operator only rely on CAA and Aerodrome Technical Reports to determine safety outcomes?
- What committees are involved to monitor safety assurance?
- Are the stakeholder committees well represented by the aerodrome operator?
- Who is responsible to monitor safety outcomes identified by committees?
- What internal reviews are documented?
- Who is responsible to assess internal reporting?
- Has the system worked effectively since the last audit?
- Were incidents appropriately assessed as per the SMS?
- Was there a satisfactory SMS audit report prepared by the SM and accepted by the Accountable executive?
- What changes have occurred since the SMS review?
- Is there a formal process to identify changes within the organisation?
- If any aerodrome services or safety function has been contracted to a third party, does the aerodrome's safety assurance program also measure the third party's safety performance?

Safety Promotion

- Have the training requirements been assessed?
- Is there a nominated training officer?

- Does training compliment the requirements of the Regulation no. 01/2014 on professional training of employees and other aerodrome contracted workers, providers of ground handling services, and users of aerodrome services providing self-handling of ground handling services?
- How is the SMS promoted to new staff?
- How is the SMS maintained to ensure changes are implemented?
- Does all staff participate in the SMS reporting and assessment and understand responsibilities?

APPENDIX 3 - Hazard logs

1. Introduction

Hazard Logs are a structured way to record the identified hazards pertaining to a project or system and to record the actions that are planned or have taken place to address the registered hazards.

The Hazard Log should be used at the very beginning of a project and be kept up to date as a living document throughout the lifecycle of the project.

Early in the life of a Hazard Log, the information logged for each hazard may be limited. As the project develops and further risk assessment and mitigation processes are undertaken, more detail can be added to the Log.

At milestones of a project, for example just before putting a new system into operational service, the Hazard Log can be reviewed to see the status of the associated hazards i.e. to ensure that all hazards have been addressed (mitigated) or accepted and prove to be a tolerable risk.

The Hazard Log can be used to log the outcome of the Hazard Identification processes e.g. brainstorming, HIRA, etc.

2. Developing a Hazard Log

The Hazard Log normally takes the form of a series of forms, where each form filled in represents one hazard or one of several possible consequences of a hazard.

Figure 1 shows the typical composition of a Hazard Log. Within the form are a series of headings that are explained further in the following text.

Project or System: State the project or system to which the hazard identified is applicable.

Hazard Log ID: Use this entry to uniquely number this hazard log entry for document control purposes.

Hazard ID: Copy any Hazard Identity (ID) number allocated during the Hazard Identification process.

Identified by: Name the person or group that identified the hazard and/or the hazard identification process used.

Date Created: Enter the date that this Hazard Log form was first used.

Last Update Action: State the last fields on this form that were updated.

Date of Last Update: Enter the date the last time this form was updated.

Hazard Description: Describe the hazard. This may take the form of how the hazard was recorded during a hazard identification process.

Hazard Category: Use this field to enter categories for sorting hazards e.g. Technical, Operational, Training, and Procedural, etc.

Hazard Consequence: Enter the consequence that the hazard could manifest.

NOTE: A single hazard may have more than one consequence. Use multiple sheets where other significant consequences need to be logged.

This Hazard Probability (Qualitative and/or Quantitative): Enter the probability of the hazard manifesting into the consequence. Enter a probability value if available, or qualitative description (see Figure 5 from Chapter 4).

Cumulative Hazards Probability (Qualitative and/or Quantitative): Where it has been identified that more than one hazard leads to the same consequence, enter the summation of the probabilities of the contributing hazards to identify the total likelihood of the consequence manifesting.

Severity: Enter the severity (see Figure 4 from Chapter 4).

Proposed Action/Mitigation: Enter the action or mitigation that has been devised to deal with this hazard.

Proposed By: Name the person or team that proposed the action or mitigation.

Actionee: Name the person, team or organisation that will be carrying out the action or mitigation.

Planned Date: Enter the date when the Proposed Action/Mitigation is intended to be implemented.

Mitigation/Action Taken: State the action actually taken (this may be as proposed above).

Date of Action: Enter the date the action was taken.

Action Status: State whether the Action is ongoing, partially complete or complete.

Status of this Hazard Log Entry: Enter whether this Hazard Log entry is awaiting any further input, is awaiting closure etc.

Date Closed: Enter the date when it was agreed that no further action would be taken with respect to this Hazard Log entry.

Continuation Sheet? (Y/N): Enter 'Y' where there is further information relevant to this Hazard Log entry contained on an additional sheet of paper.

Hazard Log Form		
Project or system		Hazard Log ID
Hazard ID	Identified by	Date created
Last update action		Date of last update
Hazard Description		
Hazard Category		
Hazard Consequence		
This hazard probability (Qualitative and/or quantitative)		Severity
Cumulative hazards probability (Qualitative and/or quantitative)		
Proposed action/mitigation		
Proposed by	Actionee	Planned date
Mitigation/action taken		
Date of action		Action status
State of this hazard log entry		Date closed
Continuation sheet? (Y/N)		

Figure 1.Hazard Log Form