LIBYA

GOVERNMENT OF LIBYA

MINSTRY OF TRANSPORT

CIVIL AVIATION AUTHORITY

ليـــبيــا

الحكومة الليبية

وزارة المواصلات والنقل

مصلحة الطيران المدني

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Safety Management Systems

General

Pursuant to the rules mentioned in Civil Aviation Law No. 6 of 2005, the Director General of Civil Aviation Authority (DGCA) issued this Advisory Circular which contains information about standards, practices, and procedures that the General Director has found to be an Acceptable Means of Compliance (AMC) with the associated rule.

This Advisory Circular may also include Guidance Material (GM) to facilitate compliance with the rule requirements.

Purpose

This Advisory Circular (AC) introduces the concept of a Safety Management System (SMS), and provides guidance for SMS development to Aircraft Operators and Aviation Service Providers.

Related Rules

- LyCAA CAR's Parts 119, 121, 125, 135 and 139
- ICAO Annexes 6 (Vol. I & III), 11 and 14
- ICAO Documents 9760, 9774
- ICAO Safety Management Manual (Doc 9859)

Applicability

This AC applies to all Libyan Aircraft Operators and Aviation Service Providers.

Change Notice

This Advisory Circular shall remain valid until updated, and/or canceled.

Published by
Civil Aviation Authority
PO Box 14399

Authorized by
Director General of Civil Aviation Authority

Capt. Nasereddin Shaebelain

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Section 1 —

1.1 General:

The modern aviation system is characterized by increasingly diverse and complex networks of business and governmental organizations. The rapidly changing aviation operational environment requires these organizations to adapt continuously to maintain their viability and relevance. The aviation system is also becoming increasingly global. Few business entities' markets, supplier networks, and operations are confined entirely within the boundaries of a single country. These characteristics of complexity, diversity, and change add to the importance of sound management of functions that are essential to safe operations. While safety efforts in the aviation system have been highly successful to date, the rapid increase in the volume and variety of aviation operations push the limitations of current safety strategies and practices. Along with this trend is the problem of decreasing resources to be applied by both business and government organizations. These processes have forced a fresh look at the safety strategies of the future. The best approach to problems of increased aviation activity and decreased resources is to bring safety efforts into the normal management framework of aviation operations. Just as businesses and government organizations should manage these factors effectively to accomplish their missions or to maintain business viability, they must likewise provide sound management of safety. This innovation in aviation system safety is best termed "Safety Management Systems" a term indicating that safety efforts are most effective when made part of business and government management of operations and oversight.

1.2 Definition:

Aircraft Operators	Are those holders of either Air Operator Certificate or Air Operator Permit issued in accordance with applicable LyCAR or administrative order
ALARP	As low as reasonably practicable
ALoS	Acceptable Level of Safety (ALoS) expresses the safety performance indicator benchmark or alert level(s) of an organization. They are the minimum safety performance deemed acceptable to an organization while conducting their core business functions. They are subject to acceptance by LyCAA.
Aviation Service Providers	Includes: • Approved Aircraft Maintenance Organizations and Maintenance Sources • Air Navigation Service providers • Aerodrome Operators

Hazard	It is a condition, object or activity with the potential of causing injuries to personnel, damage to equipment or structures, loss of material, or reduction of ability to perform a prescribed function.
HIRA	Hazard Identification and Risk Assessment
Mitigation	Measures to eliminate a hazard or to reduce the probability/ severity of a risk.
Probability	Likelihood that a situation of danger might occur
Risk Index	Combined value of risk probability and severity
Risk	It is the chance of a loss or injury, measured in terms of severity and probability. The chance that an event can happen and the consequences when it does
Safety Assessment	The process or action of performing hazard identification and risk analysis.
Safety management system	A systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures.
Severity	The possible consequences of a situation of danger, taking as reference the worst foreseeable situation
SMS	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
The Authority	Libyan Civil Aviation Authority
The State	LIBYA

Section 2 —

2.1 Introduction

The purpose of this document is to provide guidance on the implementation of Safety Management Systems (SMS) for Aviation Service Provider. The guidance is designed to give the reader information on SMS concepts and the development of management polices and processes. The guidance assumes the reader has a sound understanding of SMS principles. While operators are encouraged to review this material, future legislation governing the mandating of SMS will be based upon ICAO Document 9859 – Safety Management Manual. Operators are therefore encouraged to use ICAO Document 9859 as their principal source of guidance on SMS. It is important to recognize that SMS are top down driven systems, which means that the Accountable Manager of the organization is responsible for the implementation and continuing compliance of the SMS. Without the wholehearted support of the Accountable Manager an SMS will not be effective. There is no 'one size fits all' model of an SMS that will cater for all types of operators. Complex SMS are likely to be inappropriate for small operators, and such operators should tailor their SMS to suit the size, nature and complexity of the operation and allocate resources accordingly. Guidance for small operators is specifically covered in this document.

2.2 Safety Management System (SMS)

Safety cannot be achieved by simply introducing rules or directives concerning the procedures to be followed by operational employees; it encompasses most of the activities of the organization. For this reason, safety management must start from senior management, and the effects on safety must be examined at all levels of the organization. A Safety Management System (SMS) 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 organization. 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.

2.3 Benefits of SMS

The primary reason for the introduction of SMS is to improve existing levels of aviation safety, i.e. reduction in aviation accidents and incidents, through a systematic process of hazard and risk management. An effective safety management system may also enable organizations to reap the following additional benefits:

- Minimize direct and indirect costs resulting from accidents and incidents

- Gain safety recognition from customers and travelling public

- Create a positive, reliable and generative organizational culture

- Reduction in insurance rate

- Exceed regulatory requirements with simultaneous bottom line and productivity gains

- Proof of due diligence in event of legal or regulatory safety enquiries

- Improved working environment resulting in better productivity and morale

- Synergy in the safety related processes and functions within the organization

2.4 SMS Implementation Schedule and Mandatory Deadline

Annex 6. 11 and 14 to the Convention on International Civil Aviation, and ICAO Doc. 9760 requires States to mandate the implementation of safety management systems by Air Operators, Maintenance Organizations, Air Navigation Service providers and Aerodrome Operators, by January 2009. In the state of Libya, SMS will be mandated on 30 June 2013. After such date, all Libyan Aircraft Operators and aviation service providers must (by then) have in place a LyCAA accepted SMS manual. LyCAA validation of all established Aircraft Operators and Aviation Service Providers SMS will commence from 30 June 2013. New Aircraft Operators and Aviation Service Providers applications from 30 June 2013 will have to submit a SMS manual at the time of application together with all other required manuals. Minimum performance criteria of new applicant's SMS shall be the same as that which is applicable for existing organizations for that year.

Note: Nothing will preclude Libyan Aircraft Operators and Aviation Service Providers who have SMS Manual in place in the time of issuing of this AC to proceed in sending their SMS Manuals to be validated by LyCAA even before 30 June 2013 *provided their SMS Manual is being reviewed in the light of this AC rules.*

2.5 SMS Regulatory Requirements

By the publication of this AC, all Libyan Aircraft Operators and Aviation Service Providers are instructed to initiate the implementation of a Safety Management System. Such a system shall include the following high-level objectives:

   a) Identifies safety hazards and assesses controls and mitigates risks;
   b) Ensures that remedial actions necessary to maintain an acceptable level of safety is implemented;
   c) Provides for continuous monitoring and regular assessment of the safety level achieved; and,
   d) Aims to make continuous improvement to the overall level of safety.

The framework for the implementation and maintenance of a safety management system must include, as a minimum, the following twelve elements:

Safety Policy and Objectives

   a) Management commitment and responsibility
   b) Safety accountabilities of managers
   c) Appointment of key safety personnel
   d) Emergency response planning
   e) Documentation and records

Safety Risk Management

   f) Hazard identification processes
   g) Risk assessment and mitigation processes

Safety Assurance

   h) Safety performance monitoring and measurement
   i) Management of change

j) Continuous improvement and audit

Safety Promotion

k) Training and education

l) Safety Communication

A safety management system shall clearly define lines of safety accountability throughout the organization, including a direct accountability for safety on the part of senior management.

Aircraft Operators and Aviation Service Providers are free to build their SMS to the complexity of their operations. Organizations have a wide range of procedural options for compliance, and are encouraged to identify the best method of compliance to meet their individual circumstances. The key to a successful SMS is to develop and grow the SMS based on the organization's needs and customized to its operations. SMS implementation will be incorporated as a mandatory requirement for all Libyan Aircraft Operators and Aviation Service Providers by 30 June 2013.

2.6 Senior Managements Accountability for Aviation Safety

The senior management of the organization led by the Chief Executive Officer is ultimately responsible for the entire organization's attitude towards safety. Its organization 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. LyCAA therefore considers it the responsibility of the Chief Executive Officer, as the Accountable Manager, to effectively implement the organization's safety management system. The Accountable Manager, having full authority over human resources and financial issues, must ensure that the necessary resources are allocated to the management of safety. He or she has direct responsibility for the conduct of the organization's affairs and final responsibility for all safety issues. Senior management's commitment to safety is first demonstrated to the organization's staff through its stated safety policies, objectives and goals. The Accountable Manager, supported by the organization's senior management team, must therefore be responsible for:

- Developing the organization's safety policy

- Establishing safety objectives, goals and performance indicators

- Communicating, with visible endorsement, the safety policy, objectives and goals to all staff

- Providing the necessary human and financial resources

Note: In very large companies, it may be the case that the Chief Executive Officer may not be directly involved in the aviation business unit of the company. In such cases, the most senior person responsible for the aviation business unit, who has corporate authority for ensuring that all work can be financed and carried out to the required safety standards, may be accepted as the Accountable Manager.

2.7 Implementing a Safety Management System

To establish an SMS, the organization would need to build up its key SMS components. Following are guidance on what those components would be like. Organizations may scope these components to suit their operations:

SAFETY POLICY AND OBJECTIVES

a) Management Commitment and Responsibility

(i) Safety Policy

The Accountable Manager shall have ultimate responsibility for the implementation and maintenance of the SMS. He or she should have full control of human/ financial resources and have final authority over operations under the certificate of approval. He or she should have final responsibility for all aviation 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 organization. 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. It should be a straightforward statement that includes the following points:

- Senior management commitment and intentions with regard to safety

- The organization's safety management principles

- Establishment of safety as a core value

- Responsibility for the safety programme

- Non-Punitive Reporting policy (Just culture)

This safety policy should bear visible endorsement by the Accountable Manager and all members of the organization's senior management team, and communicated to all levels within the organization. A safety policy statement could look like this:

To prevent aviation accidents and incidents our organization will maintain an active safety management system. I support the open sharing of information on all safety issues and encourage all employees to report significant errors, safety hazards or concerns. I pledge that no staff member will be asked to compromise our safety standards to "get the job done".

Safety is a corporate value of this company, and we believe in providing our employees and customers with a safe environment. All employees must comply with this policy.

Our overall safety objective is the proactive management of identifiable hazards and their associated risks with the intent to eliminate their potential for affecting aviation safety, and for injury to people and damage to equipment or the environment. To that end, we will continuously examine our operation for these hazards and find ways to minimize them. We will encourage hazards and incident reporting, train staff on safety management, document our findings and mitigation actions and strive for continuous improvement.

Ultimate responsibility for aviation safety in the company rests with me as the Chief Executive Officer/Accountable Manager. Responsibility for making our operations safer for everyone lies with each one of us – from managers to front-line employees. Each manager is responsible for implementing the safety management system in his or her area of responsibility, and will be held accountable to ensure that all reasonable steps are taken.

In preparing a safety policy, senior management should consult widely with key staff members in charge of safety-critical areas. Consultation ensures that the document is relevant to staff and encourages buy-in to the safety policy.

(ii) Safety Objectives

In conjunction with an organization's overall safety policy statement, there should be a set of underlying tangible safety objectives. Safety objectives are broad directions set in place to facilitate the establishment of specific safety goals or desired targets. These would cover

relevant aspects of the organization's safety vision, senior management commitments, realistic safety milestones and desired outcomes. They should be unambiguous and reviewed on a regular basis. Examples of such safety objectives are listed below:

- To identify and eliminate hazardous conditions within our aviation related processes and operations
- To perform hazard and risk assessment for all proposed new equipment acquisitions, facilities, operations and procedures
- To promulgate an ongoing systematic hazard and risk assessment plan.
- To provide relevant SMS training/ education to all personnel.
- To provide a safe, healthy work environment for all personnel
- To minimize accidents/incidents that is attributable to organizational factors
- To prevent damage and injury to property and people resulting from our operations
- To improve the effectiveness of the safety management system through a yearly safety audit that reviews all aspects of the SMS

b) Safety Accountabilities of Managers

Safe operations are achieved with a balanced and realistic allocation of resources between protection and production goals. The organization shall define the safety responsibilities of key management personnel as applicable. The safety accountabilities and responsibilities of all relevant departmental and/or unit managers, and in particular line managers, should be described in the organization'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 here 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.

c) 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 organization. The safety roles and accountabilities between the organization'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 organization.

(i) Safety (SMS) Manager

Although the Accountable Manager 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 as well as maintenance of SMS activities across the entire organization. This is accomplished by appointing a safety (SMS) manager whose primary responsibility is to facilitate and administer the organization's SMS. The SMS manager position, dependent on the size and structure of the organization may not necessarily be a dedicated position. He may have other non conflicting management responsibilities. The safety manager shall have direct access to the Accountable Manager. Other responsibilities of the safety manager or department would include:

- Advising the Accountable Manager and line managers on matters regarding safety management
- Managing the SMS implementation plan
- Facilitating hazard identification and risk assessment activities
- Monitoring the effectiveness of mitigation actions
- Providing periodic reports on safety performance
- Maintaining the SMS documentation
- Planning and organizing staff safety training
- Providing independent advice on safety matters to the senior management
- Coordinating and communicating (on behalf of the Accountable Manager) on issues relating to safety with the LyCAA

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, and 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

organization. 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.

Note: Safety Manager Appointment by any Organization shall be subject to LyCAA Acceptance.

(ii) Safety Review Board (Safety Committee)

A high level Safety Review Board (SRB) or 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 organization. The Accountable Manager should chair (*see note below*) this committee with all relevant functional areas of the organization being represented. A safety committee would typically consist of the Accountable Manager, 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:

- Making recommendations/ decisions concerning safety policy and objectives
- Defining safety performance indicators and set safety performance goals for the organization
- Reviewing safety performance and ensuring that corrective actions are taken in a timely manner
- Providing strategic directions to departmental Safety Action Groups (SAG) where applicable
- Directing and monitoring the initial SMS implementation process.
- Ensuring that appropriate resources are allocated to achieve the established safety performance

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

Note: Should the Accountable Manager choose to assign this task to an appropriate senior person, it should be clearly stated and substantiated the task on behalf of the Accountable Manager whose accountability for safety paragraph 2.7(a)(i) is not compromised and that he remains accountable for all decisions of the SRB.

(iii) Safety Action Group(s)

Large organizations that have relatively complex operations could set up Safety Action Groups (or equivalent sub-committees) accountable to the Safety Committee. Managers and supervisors from a given functional area would be members of the SAG for that area and would take strategic directions from the Safety Committee. The functional head of that area should chair the SAG. The role of the SAG(s) would include:

- Overseeing operational safety within the functional area.
- Managing the area's hazard identification and risk assessment activities.
- Implementing mitigation or corrective actions to improve aviation safety relevant to the area.
- Assessing the impact of aviation safety on operational changes and activating hazard and risk assessment process as appropriate.
- Maintenance and review of relevant performance indicators
- Managing safety training and promotion activities within the area.

Departmental SAG(s) may wish to appoint "SMS Coordinators" to facilitate the department's SMS activities.

d) Emergency Response Planning

An Emergency Response Plan (ERP) outlines in writing what should be done by an Aviation Service Provider upon a major safety-related incident or accident resulting in emergency or crisis situation. An ERP should include (where applicable):

- Planned actions to minimize indirect or consequential damage upon the occurrence of a crisis or emergency situation.
- Provision for preservation of aviation product/ services/ equipment to avoid subsequent safety/ quality/ continuity problems, where applicable.
- Recovery actions as well as procedures for orderly transition from normal to emergency operations
- Designation of emergency authority
- Assignment of emergency roles and responsibilities
- Authorization of key personnel for actions contained in the plan
- Coordination procedures with contractors or operators where applicable
- Criteria for safe continuation of operations, or return to normal operations

For an AOC/AOP holder, a comprehensive ERP would include other aspects of aircraft accident response such as, crisis management centre, management of an accident site, news media, coordination with state investigations, family assistance, post critical incident stress counseling, etc. It should also include arrangements for emergencies at line stations.

e) SMS Documentation

A SMS Manual (or exposition) is the key instrument for communicating the organization's SMS approach and methodology to the whole organization. It will document all aspects of the SMS, including the safety policy, objectives, accountabilities and procedures. A typical SMS Manual would include the following contents:

Document Control

- SMS Regulatory Requirements

- Scope of the Safety Management System

- Safety Policy

- Safety Objectives and Goals

- Safety Accountabilities and Key Personnel

- Non-Punitive Reporting Policy

- Safety Reporting

- Hazard Identification and Risk Assessment

- Safety Performance Monitoring and Measurement

- Safety Investigations

- SMS/ Safety Training

- SMS Audit and Safety Review

- SMS Data and Records Management

- Management of Change

- Emergency Response Plan

Appendix 4 provides further guidance on the compilation of the SMS Manual. An SMS exposition should preferably be a manual by itself. For small organizations, it is possible for the SMS exposition to be incorporated within an existing organization's exposition manual. In either case, the various SMS components and their relevant integration should be adequately and systematically documented. Where the SMS manual is a standalone document, appropriate

reference should be made to it in the relevant organization Exposition Manual. An organization's SMS manual / exposition shall be subject to LyCAA approval. In a large organization, operating a SMS generates significant amount of data, documents and reports. Proper management and record keeping of such data is crucial for sustaining an effective SMS. Effective safety analysis is totally dependent upon the availability and competent use of the safety information management system. To facilitate easy retrieval and consolidation of safety data/information, it is necessary to ensure that there is relevant integration between the various sources of such data or reports. This is important where different departments within the organization have traditionally limited the scope of safety data distribution to within the department itself. Cross functional safety data integration becomes important in this case. It is necessary that the organization maintain a systematic record of all measures taken to fulfill 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 centralized and maintained in sufficient detail to ensure traceability of all safety related decisions. Examples of such records include:

- Hazards Register

- Incident/Accident reports

- Incident/Accident investigation reports

- Safety/SMS audit reports

- Periodic analyses of safety trends/indicators

- Minutes of safety committee or safety action group meetings

- Hazard and Risk Analysis Reports, etc.

SAFETY RISK MANAGEMENT

f) Hazard Identification Processes

Organization can be considered a system consisting of organizational structures, processes, and procedures, as well as people, equipment and facilities that are necessary to accomplish the system's mission. Organizations 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 organizational hazards are identified and managed so that safety is not compromised. Organizations may

utilize a range of processes to identify hazards that are likely to jeopardize its operations or weaken its safety defenses. There is a natural (and erroneous) tendency to describe hazards as an outcome. For example, "runway incursion" is an outcome, not a hazard. On other hand, "unclear aerodrome signage" is a hazard, not an outcome. Mistaking hazards as outcomes disguise their nature and interfere with proper identification of actual outcomes or risks associated with those hazards. A correctly named hazard will enable the tracking of its source or origin on the one hand and the identification of its potential outcome(s) or risk(s) on the other. Following are some examples of hazards –

- Airline Operations: Unfamiliar phraseology, inclement weather, birds in take-off path, heavy traffic, unfamiliar airports, high terrain around airport, new on-board equipment, cabin re-configuration, recurring defects, etc.

- Aircraft/ Workshop Maintenance: Fuel vapour from open wing tanks, discrepant test equipment, ambiguous work instructions, improper shift handover procedure, inadequate training/ resources/ capabilities, improper material/ equipment handling, etc.

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

- Organizational 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

- Defenses, 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 organization'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.

The hazard identification and reporting process should be open to any employee. 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 organizational change

In essence, the three steps of hazard identification and risks projection are:

- State the generic hazard (hazard statement), e.g. an operating aircraft engine

- Identify specific components of the hazard, e.g. engine intake suction

- Project specific risk(s) associated with each hazard, e.g. foreign object ingestion

Appendix 1 shows a sample Hazard Management flowchart.

g) Risk Assessment and Mitigation Processes

(i) Risk Management

Risk management is the identification, analysis and mitigation of risks associated with the hazards of an organization's operations. Risk assessment uses conventional breakdown of risk in its two components – probability of occurrence and severity of the projected risk should it occur. Acceptability of a risk is based on the use of a risk index matrix and its corresponding acceptability/ decision criteria. While a matrix is required, the definitions and final construction of the matrix is left to the organization to design, subject to the acceptance of LyCAA. This is to allow organizations to incorporate this decision tool relevant to its operational environment. Organizations will need to ensure that the meaning of terms used in defining probability and severity are in the context of the aviation industry. Risk management is a key component of safety management systems. It is a data-driven approach to safety management resources allocation i.e. priority is accorded to activities based on their risk index. Appendix 2 shows a typical risk management process flowchart.

(ii) Risk Probability

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 like the one being assessed, or is the occurrence an isolated event?

- What other equipment, or similar types of components might have similar defects?

- What number of operating or maintenance personnel must follow the procedure(s) in question?

- How frequently is the equipment or procedure under assessment used?

- Are there organizational, management or regulatory implications that might generate larger threats to public safety?

Table 1 below shows a sample risk probability table. It is sometimes useful to attach logical meanings to the qualitative definition, as illustrated in Table 1.

Probability of occurrence		
Qualitative definition	**Meaning (in aviation context)**	**Value**
Frequent	• Likely to occur many times (has occurred frequently)	5
Occasional	• Likely to occur some times (has occurred infrequently)	4
Remote	• Unlikely, but possible to occur (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

Table 1: Typical Risk Probability Table

(iii) Risk Severity

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 organization's reputation?

Table 2 below shows a sample risk severity table.

Severity of occurrences		
Aviation definition	**Meaning (in aviation context)**	**Value**
Catastrophic	• Aircraft crash • Complete destruction of facility/ equipment • 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 operators to cope with adverse operating conditions as a result of increase in workload, or as a result of conditions impairing their efficiency. • Serious incident. • Injury to persons.	**C**
Minor	• Nuisance. • Operating limitations. • Use of alternate procedures. • Minor incident.	**D**
Negligible	• Little consequences	**E**

Table 2: Sample Risk Severity Table

(iv) Risk Index

Once the risk Probability and risk Severity values are determined, they will (together) constitute the "Risk Index" for that occurrence. The complete "Risk Index" matrix is shown in Table 3. The acceptability (action required) for each risk index is reflected in the Risk Acceptability table (Table 4).

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

Table 3: Risk Index Matrix

Note: Although the Risk Index matrix shown above is a "5 X 5" model, organizations may use other models as appropriate to their own operations.

Risk Index	Acceptability/Action Required
5A, 5B, 5C, 4A, 4B, 3A	**STOP**: Unacceptable under the existing circumstances. Do not permit any operation until sufficient control measures have been implemented to reduce risk to an acceptable level.
5D,5E, 4C, 3B, 3C, 2A, 2B	Management attention and approval of risk control/ mitigation actions required.
4D, 4E, 3D, 2C, 1A, 1B	Acceptable after review of the operation
3E, 2D, 2E, 1C, 1D, 1E	Acceptable

Table 4: Risk Acceptability Table

(v) Risk Mitigation

Risk mitigation is the process of implementing actions or defenses to eliminate or reduce the probability or severity of risks associated with hazards. The basic defenses employed in the aviation industry are technology, training and procedures (or regulations). When analyzing defenses during a mitigation process, following questions may be useful:

- Do defenses to protect against such risk (s) exist?

- Do defenses function as intended?

- Are the defenses practical for use under actual working conditions?

- Are the staffs involved aware of the risks and the defenses in place?

- Are additional risk mitigation measures required?

Three basic strategies in risk mitigation are as follows:

- Avoidance – The operation or activity is cancelled because risks exceed the benefits of continuing the operation or activity. For Example: Operations into an aerodrome surrounded by complex geography and without the necessary aids are cancelled.

- Reduction – The frequency of the operation or activity is reduced, or action is taken to reduce the magnitude of the consequences of the accepted risks. For Example: Operations into an aerodrome surrounded by complex geography and without the necessary aids are continued based upon the availability of specific aids and application of specific procedures.

- Segregation of exposure – Action is taken to isolate the effects of risks OR ensure there is build-in redundancy to protect against it i.e reducing the severity of risk. For Example: Operations into an aerodrome surrounded by complex geography are limited to day-time, visual conditions.

Appendix 3 shows a sample flowchart of the risk mitigation process and a sample risk mitigation worksheet.

(vi) Costs Considerations

During the process of evaluating mitigation actions or additional defenses, 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. Airline operation contains hazardous conditions or risks which may not be cost-effective to eliminate totally. Hence, operations may have to continue so long as safety risks associated with such hazards have been mitigated to a level that is as low as reasonably practicable. (The acronym ALARP is used to describe a safety risk which has been reduced to a level that is "as low as reasonably practicable"). In determining what is reasonably practicable, consideration is given to both the technical feasibility and the cost of further reducing the safety risk. This may involve a cost/benefit study where necessary. While the cost of risk mitigation is an important factor in safety management, it must be weighed out against the cost of undesirable outcomes due to lack of mitigation. Direct costs of incidents/accidents (which can be determined) can be reduced by insurance coverage. However, purchasing insurance only transfers the monetary aspect of a risk. It is the indirect uninsured costs which may be underestimated in such considerations. An understanding of these uninsured costs (or indirect costs) is fundamental to understanding the economics of safety. Usually they amount to more than the direct costs. These indirect costs include loss of business, damage to reputation, loss of use of equipment, loss of staff productivity, legal actions and claims, fines and citations, insurance deductibles, etc. In addition to having an effective SMS, all organizations have to comply with all the minimum requirements of the Aircraft Operators and Aviation Service Providers.

(vii) Continuing Assessment

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.

(viii) Hazard Identification and Risk Assessment (HIRA) Program

As part of an organization'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 organization'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 organization). Depending on the size and complexity of the organization, such an initial (baseline) evaluation and safety assessment program may take from several months to a few years to be fully completed. A historical review on aviation safety related incidents/ accidents associated with these operations and processes should be assessed with higher level of priority.

Organizations 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 organization 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 (baseline) safety assessment (with respect to the affected area or system) should be accounted for as appropriate.

(ix) HIRA Eligible Operations/ Processes

During an organization's initial HIRA program, there will be an apparent need to identify what are the HIRA eligible operations/ processes for the organization. In principle, all operations/ processes with the potential to harbor or 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 organization 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, organizations 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 organizations may consider as candidates for their initial/ priority HIRA performance:

Flight Operations

- Operational routes with unusual or special hazard/ risk such as ULR, ETOPs, polar, RVSM, RNP, volcanic regions, inefficient ATC, etc.

- Line stations (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 Air Operator's operations/ processes deemed by the organization as essential for priority HIRA accountability.

SAFETY ASSURANCE

h) Safety Performance Monitoring and Measurement

(i) Safety Performance Indicators

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. There is no single safety performance indicator that is appropriate to all organizations. The indicator(s) chosen should correspond to the organization's relevant safety objectives or goals. Examples of possible safety indicators would be as follows:

- Number of in flight incidents per 1000 flight hours/cycles
- Number of warranty claims per 1000 man-hours
- Component infant mortality rate
- Final test rejects rate
- Number of findings per audit (or other measurable audit performance criteria)
- Number of hazard reports received,
- APM/ ECM trends
- FDAP deviation rates/ trends

(ii) Safety Performance Monitoring

Safety performance monitoring is the process by which safety indicators of the organization 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 and where applicable safety action group level. Any significant abnormal trend or breech of the minimum acceptable (alert) level for any of the (ALoS) indicators would warrant appropriate investigation into potential hazards or risks associated with such deviation.

(iii) Safety Targets (Goals)

Safety targets (desired goals) are quantifiable and have time components. They should be achievable and realistic. These safety targets should be measured and monitored with the use of safety performance indicators where applicable. Examples of possible safety targets are as follows:

- To increase the number of hazard reports received by X % over the next Y year (See Note Below)
- To reduce days lost to injury or illness by X % over the next Y year
- To reduce direct/indirect cost due to incidents/accidents by X % over the next Y year
- To complete initial safety assessment for all existing safety related equipment, facilities, operations and procedures according to the following schedule__ (schedule details)
- To reduce annual insurance claims due to incidents/accidents by X % over the next Y year
- To reduce number of operational technical incidents by X % over the next Y year.
- Zero safety-related defect in 5 years
- X safety-related defects per 10000 man-hour
- To reduce the number of customer warranty claims by X % over the next Y year.
- To reduce the number of findings per external audit by X % over the next Y yea

Note: in a developing SMS with a new reporting system, you would expect to see an increase in the number of reports over the short term. This shows that the company culture encourages this feedback. In the long term, as the SMS matures, you would expect to see a decrease in number of hazard reports.

(iv) Acceptable Level of Safety (ALoS)

Acceptable Level of Safety (ALoS) is the expression of an organization's minimum acceptable safety performance level(s) associated with a set of pre-established safety indicators. This is the minimum safety performance that an organization should achieve while conducting

their core business functions. Each organization may have a slightly different set (combination) of ALoS indicators so long as they are commensurate with the complexity and scope of its operations. Where applicable, a combination of reactive (incident/ accident rates), proactive (audit findings) and predictive (hazard reports, FDAP deviations) should be used. Hence, there should normally be more than one ALoS indicator. Those safety performance indicators which are meant to constitute an organization's ALoS performance monitoring shall be identified accordingly in the SMS manual. Their respective minimum acceptable or alert level (s) shall be subject to LyCAA acceptance. These ALoS indicators or their respective alert levels may be subject to revision where deemed appropriate.

An organization may maintain other non ALoS related indicators as part of their quality/ reliability/ productivity/ OSHE systems etc. These other indicators should be distinguished from the ALoS indicators.

v) Management of Change

Aviation organizations 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/organizational changes, major new equipment introduction or new procedures, etc. A formal management of change process should identify changes within or from outside the organization 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 or in relation to previously completed risk mitigation as applicable. Activities with safety risks should be scheduled for a baseline hazard analysis in accordance with the organization's HIRA program see (g) (viii). 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.

j) Continuous Improvement and Audit

(i) 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:

- Regulatory SMS requirements

- Structure of safety accountabilities

- Organizational safety policies and standards

- Documentation, including SMS manual and SMS records

- Compliance with SMS hazard/ risk evaluation procedures

- Adequacy of staff training for their SMS roles

- Performance indicators and Acceptable Level of Safety

- Compliance with safety assessment plan or schedule

- Effective SMS integration with other control systems

- SMS integration with contractors where applicable

- Continuing assessments and management of change

- Review completed safety assessments for any that may be obviously sub-Standard or inadequate

(ii) 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

SAFETY PROMOTION

k) Training and Education

Safety training and education is an essential foundation for the development and maintenance of a safety culture. The provision of appropriate safety training to all staff is an indication of management's commitment to SMS. The procedure for safety training and education should include the following where applicable:

- a documented process to identify training requirements

- a validation process that measures the effectiveness of training

- initial general/ job-specific safety training

- initial training incorporating SMS, Human Factors and organizational factors

- 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 Manager. 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. SMS training may possibly be integrated with related training programs e.g. HFEM, QMS etc. In-house SMS training programs (class room or web-based), should be conducted or produced by personnel who have undergone appropriate SMS training. Following is an example of the scope of SMS training:

Operations/ Support Personnel:

- Safety policy

- SMS fundamentals including definition of hazards, consequences and risks, safety risk

management process

- Roles and responsibilities
- Safety reporting and the organization's safety reporting system
- Managers and Supervisors:
- The above
- Safety Responsibilities in promoting the SMS and engaging operational personnel in hazard reporting
- Knowledge of safety process, HIRA and change management
- Safety data analysis

Senior Managers:

- All the above
- Safety assurance and safety promotion
- Safety roles and responsibilities
- Acceptable Level of Safety indicators

Accountable Manager:

- General awareness of the organization's SMS, including SMS roles and responsibilities, safety policy and objectives, safety risk management and safety assurance
- Knowledge of LyCAA SMS regulations

SMS Manager:

- Should attend a formal comprehensive aviation SMS training course.
- Be familiar with relevant LyCAA SMS regulations and ICAO SMS guidance materials

l) Safety Communication

There is a need to communicate the organization's SMS processes and activities to the organization's population. The purpose of such communication includes:
- Ensuring that all staff members are aware of the SMS
- Conveying safety lessons/information

- Explaining why SMS related activities are introduced or changed

- Conveying SMS activities updates

- Dissemination of completed safety assessments to concerned personnel.

- Educating personnel on procedure for hazards reporting

- Promotion of the company's safety objectives, goals and culture

The medium for such communication/promotion may include notices or statements on safety policy/objectives, newsletters, bulletins, safety seminars/workshops, orientation program, etc.

2.8 SMS Integration

In civil aviation today, there is various safety or quality related control systems existing within an organization, such as:

- ISO 9000, etc

- Quality management system (QMS)

- Human Factor and Error Management System (HFEM)

- Environment management system (EMS)

- Occupational health and safety management system (OHSMS)

- Security management system, etc.

There are different ways to integrate a safety management system in the operation of an organization. Aviation organizations may consider integrating their management system for quality, safety, HFEM, security, occupational health and environmental protection where appropriate. Possible areas of integration would include having a:

- Common safety committee

- HIRA team with personnel from the various disciplines

- Consolidated hazards/ HIRA register

- Integrated SMS/ HF training

- Coordinated communication and promotion efforts

The benefits of such integration would include:

- Reducing resource duplication and therefore costs.

- Easy integration and processing of cross functional safety related data.

- Reducing potentially conflicting objectives and relationships.

- Recognition of aviation safety as the over arching objective of all controlling systems within an aviation organization

Apart from internal integration of an organization's SMS components with related control systems, such integration should be coordinated with other organizations or contractors whereby such interface with their relevant SMS or control system is necessary during the provision of services.

2.9 GAP Analysis and Implementation Plan

It is apparent that organizations 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 review may include comparison of the SMS elements found in this AC against the existing systems in your organization. A checklist may be used to account for each of this AC and their respective sub- elements. Remarks for partial compliance or deviations should be made as well as actions required in order to meet the criteria. There should be a column for annotating existing company documentation where the requirement is addressed. Once the gap analysis is complete and fully documented, the items you have identified as missing or deficient will form the basis of your SMS project plan. The first target of the plan should be compilation of the organization's SMS manual.
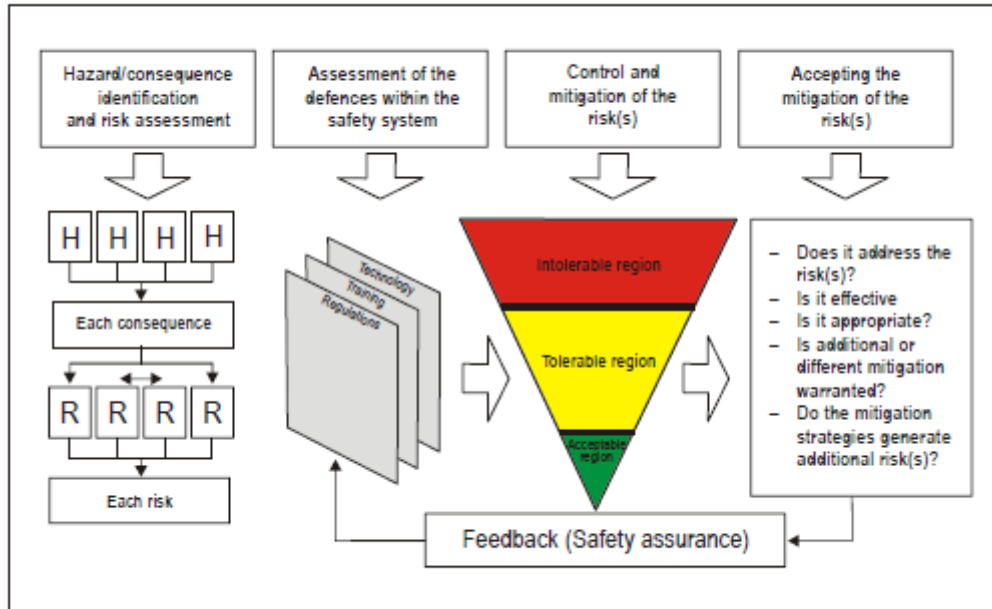
APPENDIX 1: Sample Hazard Management Flowchart
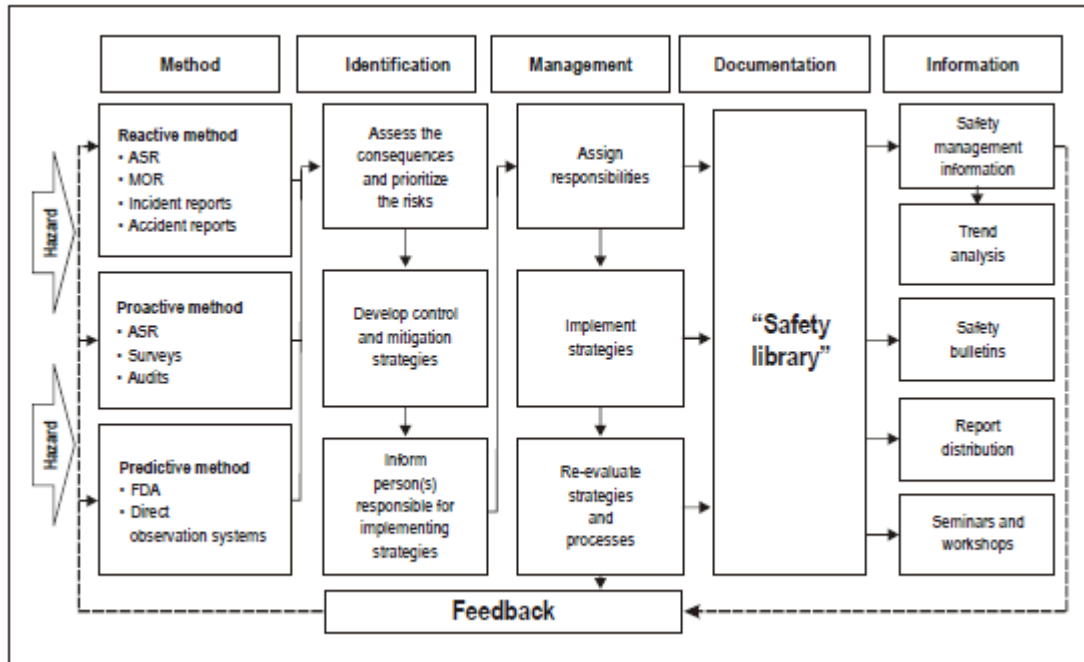
APPENDIX 2: Sample Risk Management Process Flowchart
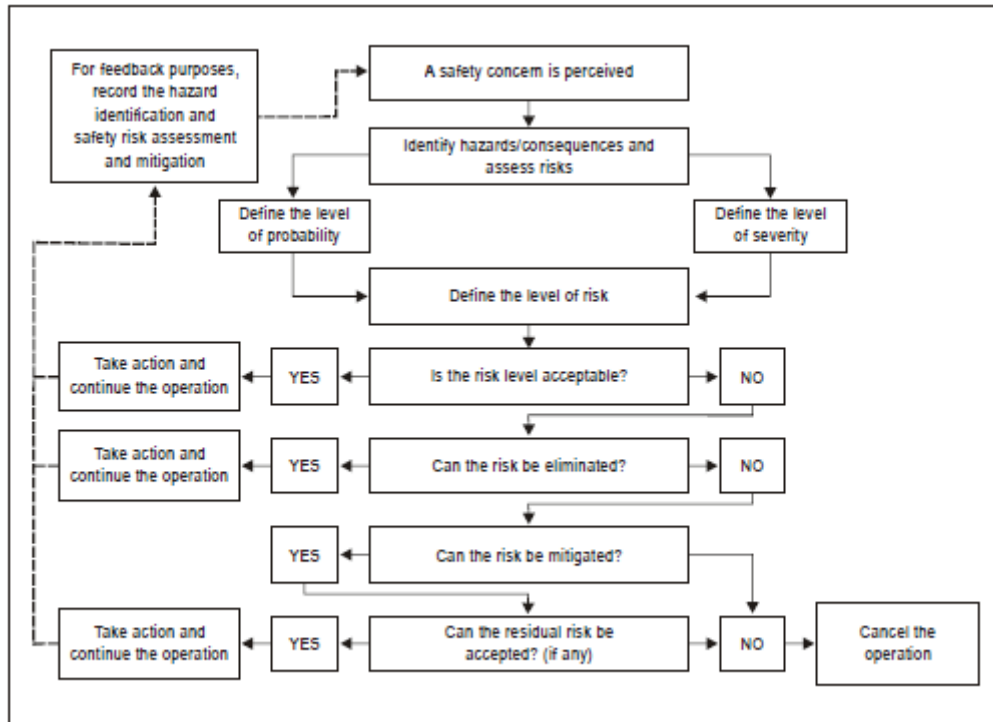
APPENDIX 3: Example of a Risk Mitigation Process

Sample Flowchart of the Risk Mitigation Process

Sample Risk Mitigation Worksheet

Item	Type of operation or activity	Identified hazard	Projected Risk(s)	Current mitigation actions	Current Risk Index	Additional mitigation actions (if required)	Resultant Risk Index
1	Introduction of new equipment "XYZ"	Hazard No 1 -	Risk No 1-1		3A		1B
			Risk No 1-2		2B		2D
		Hazard No 2	Risk No 2-1		4C		4D
		Hazard No 3	Risk No 3-1		3B		2C

APPENDIX 4: Guidance for the Development of a Safety Management System Manual

This appendix is designed to help organizations document the processes and procedures required for a Safety Management System. It is intended to provide guidance for the development of a Safety Management System Manual, which can be a separate stand-alone document or it could be incorporated into an existing manual, as required. This suggested format is one way in which an organization can meet the documentation requirements of SMS. Use the SMS manual template to describe the processes for your company SMS. Remember that small operations will have very basic and simple processes compared to a larger company. For example, the reporting system for a company with three employees may well be verbal in many cases. 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. The guide is formatted in the following manner:

- Section headings with numbering
- Objective
- Criteria
- 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 manual writer is expected to achieve. The "**Criteria'** defines the scope of what must be considered when writing the section. The "**Cross Reference Document**" is for you to annotate references of other manuals or SOPs of the organization which contain relevant details of the element or process as applicable.

Manual Contents

1. Document Control
2. SMS Regulatory Requirements
3. Scope and Integration of the Safety Management System
4. Safety Policy
5. Safety Objectives and Goals
6. Safety Accountabilities and Key Personnel
7. Non-Punitive Reporting Policy
8. Safety Reporting
9. Hazard Identification and Risk Assessment
10. Safety Performance Monitoring and Measurement
11. Safety Investigations
12. Safety Training and Communication
13. Continuous Improvement and SMS Audit
14. SMS Data and Records Management
15. Management of Change
16. Emergency Response Plan

1. Document Control

Objective

Describe how you intend to keep the manual up to date and ensure that all personnel have the most current version.

Criteria

Hard copy or controlled electronic media are used for manual distribution. The initial correlation of this manual with other approved documentation, such as Company Exposition Manual, Maintenance Control Manual, Flight Operations Manual, as applicable. There is a process for periodic review of other safety management system related documentation and manuals to ensure their continuing suitability, adequacy and effectiveness. The manual is readily accessible by personnel. The manual is approved by the Accountable Manager.

Note: This SMS manual/ exposition is subject to LyCAA approval.

Cross Reference Documents:

2. SMS Regulatory Requirements

Objective

Elaborate on current LyCAA SMS regulations for necessary reference and awareness by all personnel

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Criteria

Spell out current SMS regulations/standards. Include compliance timeframe and advisory material references as applicable. Where, appropriate, to elaborate or explain the significance and implications of those regulations to the organization. Where, relevant, correlation to other safety related requirements or standards may be highlighted such as ICAO Annexes.

Cross Reference Documents:

3. Scope and Integration of the Safety Management System

Objective

Describe scope and extent of the organization's aviation related operations and facilities within which the SMS will apply. The scope of HIRA eligible processes, equipment and operations should also be addressed.

> **Criteria**
>
> Spell out nature of the organization's aviation business and its position or role within the industry as a whole. Identify equipment, facilities, work scope, capabilities and other relevant aspects of the organization within which the SMS will apply. Identify the scope of all relevant processes, operations and equipment which are deemed to be eligible for the organization'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.
>
> Where the SMS is expected to be operated or administered across a group of interlinked organizations or contractors, such integration and associated accountabilities should be defined and documented as applicable.
>
> Where there are other related control/ management systems within the organization such as ISO9000, HFEM, OHSAS, QMS, MEDA etc, their relevant integration (where applicable) within the aviation SMS should be identified.

Cross Reference Documents:

4. Safety Policy

Objective

Describe the organization'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**
>
> The safety policy should be appropriate to the size and complexity of the organization. The safety policy states the organization's intentions, management principles and commitment to continuous improvement in the aviation safety level. The safety policy is approved by the Accountable Manager. The safety policy is promoted by the Accountable Manager. The safety policy is reviewed periodically. Personnel at all levels are involved in the establishment and maintenance of the safety management system. The safety policy is communicated to all employees with the intent that they are made aware of their individual safety obligations. The safety policy should be signed by the Accountable Manager.

Cross Reference Documents:

5. Safety Objectives and Goals

Objective

Describe the safety objectives and the safety performance goals of the organization. The safety objectives would be a short statement that describes in broad terms what you hope to achieve. In some cases this statement may be incorporated into the Safety Policy Statement. Performance goals are specific and measurable goals that allow you to measure the degree of success of your SMS.

Criteria

Safety objectives are expressed as a top-level statement describing the organization's commitment to achieving safety. There is a formal process to develop a set of safety objectives/ goals necessary to provide direction and impetus to the SMS. These objectives/ goals can be supported by data based on safety indicators or parameters. Safety objectives/ goals are publicized and distributed. Resources have been allocated for achieving the objectives and goals.

Cross Reference Documents:

6. Safety Accountabilities and Key personnel

Objective

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

Criteria

The Accountable Manager is responsible for ensuring that the safety management system is properly implemented and performing to requirements in all areas of the organization. Appropriate Safety Manager (office), Safety Committee or Safety Action Groups have been appointed as appropriate. Safety authorities, responsibilities and accountabilities of personnel at all levels of the organization are defined and documented. Safety authorities, responsibilities and accountabilities are promulgated to all personnel in key documentation and communication media. All personnel understand their authorities, responsibilities and accountabilities in regards to all safety management processes, decision and actions. A SMS organizational accountabilities chart is available.

Cross Reference Documents:

7. Non-Punitive Reporting Policy (Just Culture)

Objective

Describe the system or policy under which employees are encouraged to report errors, safety deficiencies, hazards, accidents, and incidents.

Criteria.

There is a policy in place that encourages employees to report errors, safety deficiencies, hazards or occurrences. Conditions under which punitive disciplinary action would be considered (e.g. illegal activity, recklessness, gross negligence or willful misconduct) are clearly defined. The policy is widely understood within the organization.

Cross Reference Documents:

8. Safety Reporting

Objective

A reporting system should include both reactive (accident/incident reports etc) and proactive/ predictive (hazard reports etc) data. Describe how your reporting system is designed and how it works. Factors to consider include: report format, confidentiality, data collection and analysis and subsequent dissemination of information on corrective actions, preventive measures and recovery controls.

Criteria

The organization has a process or system that provides for the capture of internal information including incidents, accidents, hazards and other data relevant to SMS.

The reporting process is simple, accessible and commensurate with the size of the organization. Reports are reviewed at the appropriate level of management.

There is a feedback process to notify contributors that their reports have been received and to share the results of the analysis. The report form is simple, standardized and accessible across the organization. There is a process to ensure that information is received from all areas of the organization within the scope of the SMS. There is a process in place to monitor and analyze trends. The organization has a process for the systematic investigation and analysis of operational conditions or activities that have been identified as potential hazards

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Cross Reference Documents:

9. Hazard Identification and Risk Assessment

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

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), Hazard identification and risk analysis procedures to manifest aviation safety as its fundamental context. There is a criterion for evaluating risk and the tolerable level of risk the organization is willing to accept together with any mitigating factors. The organization has risk control strategies that include corrective, preventive and recovery action plans. The organization has a process for evaluating and updating the effectiveness of the corrective, preventive and recovery measures that have been developed. Corrective, preventive and recovery actions, including timelines, are documented.

Cross Reference Documents:

10. Safety Performance Monitoring and Measurement

Objective

Describe how you plan to review the effectiveness of your SMS. This includes the safety performance of the company by reviewing the safety performance indicators.

Criteria

There is a formal process to develop and maintain a set of safety performance indicators for trend, target (desired level) as well as minimum acceptable (alert) level monitoring. Safety alert (caution) levels which are intended to constitute the organization's minimum Acceptable Level of Safety (ALoS) shall be identified accordingly. These established levels shall be identified in this section of the manual and shall be subject to LyCAA acceptance.

Periodic planned reviews of company safety performance indicators including an examination of the company's Safety Management System to ensure its continuing suitability, adequacy and effectiveness.

Cross Reference Documents:

11. Safety Investigations

Objective

Describe how accidents/incidents are investigated. Explain how the contributing factors to an accident/incident are determined and how corrective action is recommended to prevent reoccurrence. Describe how such corrective/preventive actions are reviewed for updating any existing safety assessment or the need to initiate a safety assessment for newly uncovered hazards/risks.

Criteria

Measures exist that ensure reported occurrences and incidents are investigated where applicable. There is a process to ensure that such investigations include identification of active failures as well as contributing organizational factors. Investigation procedure and format includes the integration of safety related findings with the SMS. This ensures that appropriate SMS follow up actions on related as well as unrelated hazard or risks uncovered during the course of investigations are addressed.

Cross Reference Documents:

12. Safety Training and Communication

Objective

Describe the type of SMS and other safety related training that staff receives 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 organization.

Criteria

Training syllabus, eligibility and requirements are documented. There is a validation process that measures the effectiveness of training. The training includes initial, recurrent and update training, where applicable. The organization's SMS training is part of the organization's overall training program. SMS awareness is incorporated into employment or indoctrination program Safety communication processes/ channels within the organization.

Cross Reference Documents:

13. Continuous Improvement and SMS Audit

Objective

Describe the processes for continuous improvement and review of your SMS.

Criteria

Regular audit/reviews of company safety performance indicators, including an internal assessment/ audit of the company's Safety Management System to ensure its continuing suitability, adequacy and effectiveness. Describe any other programs contributing to continuous improvement of the organization's SMS and safety performance e.g. MEDA, safety surveys, ISO systems, etc.

Cross Reference Documents:

14. SMS Data and Records Management

Objective

Describe your method of recording and storing all SMS related documents.

Criteria

The organization has a records system that ensures the generation and retention of all records necessary to document and support the SMS. Records kept include hazard reports, risk assessments reports, SAG/SRB meeting notes, safety performance monitoring charts, SMS audit reports, SMS training records, etc

Cross Reference Documents

15. Management of Change

Objective

Describe how you manage organizational internal/external/process changes that may have an impact on safety. How such processes are integrated with your SMS.

Criteria

The organization has a standard procedure or policy to perform or review safety assessments for all substantial internal or external changes which may have safety implications. There is procedure for performing safety assessment prior to introduction of new equipment or processes which may have safety implications before they are commissioned. All concerned stake holders within or without the organization are involved in such reviews. All such reviews are documented and approved by the management as applicable.

Cross Reference Documents:

16. Emergency Response Plan

Objective

Describe the organization's intentions 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 developed as a separate document or it can be placed in this manual.

Criteria

The organization has an emergency plan that outlines roles and responsibilities in the event of a major incident, crisis or accident. There is a notification process that includes an emergency call list and an internal mobilization process. The organization has arrangements with other agencies for aid and the provision of emergency services as applicable. The organization has procedures for emergency mode operations where applicable.

There is a procedure for overseeing the welfare of all affected individuals and for notifying next of kin. The organization has established procedures for handling media and insurance related issues. There are defined accident investigation responsibilities within the organization. The requirement for preservation of evidence, securing affected area and mandatory/governmental reporting is clearly stated. There is emergency preparedness and response training for affected personnel. A disabled aircraft or equipment evacuation plan is developed by the organization in consultation with aircraft/ equipment owners, aerodrome operators or other agencies as applicable. A procedure exists for recording activities during an emergency response.

Cross Reference Documents: