



Manual on Aerodrome Safety Management System

FIRST EDITION

09 February 2010

CIVIL AVIATION AUTHORITY, BANGLADESH

LIST OF EFFECTIVE PAGES

Chapter	Pages	Version/ Revision	Date of Issue
List of effective pages	ii	0.00	09 Feb. 2010
Record of amendments	iii	0.00	09 Feb. 2010
Revision History	iv	0.00	09 Feb. 2010
Table of contents	v	0.00	09 Feb. 2010
Foreword	vi	0.00	09 Feb. 2010
1. Introduction	1	0.00	09 Feb. 2010
2. Definitions	1 to 5	0.00	09 Feb. 2010
3. Scope and applicability	5 to 6	0.00	09 Feb. 2010
4. General	6	0.00	09 Feb. 2010
5. Safety policy and objectives	6 - 10	0.00	09 Feb. 2010
6. Safety risk management	10 - 11	0.00	09 Feb. 2010
7. Safety assurance	11 - 12	0.00	09 Feb. 2010
8. Safety promotion	12 - 13	0.00	09 Feb. 2010
9. Quality policy	13	0.00	09 Feb. 2010
10. Implementation of the SMS	13 - 15	0.00	09 Feb. 2010
11. Appendices	App. 1 – App. 25	0.00	09 Feb. 2010

RECORD OF AMENDMENTS

[illegible]

REVISION HISTORY

Revision/ Version	Date	Chapter/ Section	Details
0.00	09 February 2010	All	Manual on Aerodrome Safety Management System

TABLE OF CONTENTS

	Page
List of effective pages	ii
Record of amendments	iii
Revision History	iv
Table of contents	v
Foreword	vi
1. Introduction	1
2. Definitions	1
3. Scope and applicability	2
4. General	6
5. Safety policy and objectives	6
6. Safety risk management	10
7. Safety assurance	11
8. Safety promotion	12
9. Quality policy	13
10. Implementation of the SMS	13
Appendices	App. 1

FOREWORD

In exercise of the powers conferred by Rule 4 of Civil Aviation Rules 1984 (CAR 84), the Chairman of Civil Aviation authority, Bangladesh (CAAB) is pleased to issue this Air Navigation Order (ANO) as a Manual on Aerodrome Safety Management System.

An Aerodrome certificate holder is expected to comply with the Rules laid down in the Civil Aviation Rules 1984 and Specifications of Manual of Aerodrome Standards (MAS), Bangladesh.

This ANO is issued under Rules 4 of CAR 84 and in accordance with the provisions contained in Rule 260A (15) and 260C (8) of CAR 84. This ANO stipulates the requirements to be fulfilled by the aerodrome operator to develop safety management manual and implementation of safety management system in aerodrome operations for all certified aerodromes.

The responsibility for the technical matters within this ANO is the responsibility of the Flight Safety and Regulations Division of CAAB.

This ANO is issued and amended under the authority of the Chairman of Civil Aviation Authority, Bangladesh.



Air Cdre. Sakeb Iqbal Khan Majlis, ndu, psc
Chairman of Civil Aviation Authority, Bangladesh
Kurmitola, Dhaka, Bangladesh

1. Introduction

A Safety Management System (SMS) is a formal organizational system to manage safety. It integrates a suite of active safety management tools, including senior management commitment, hazard identification and risk management, safety reporting, audit, investigations and remedial actions, safety culture and education supported by clear policies and processes. The policies contained in the SMS are about how safety is to be regarded, who is responsible for safety and what level of performance is to be achieved. The SMS defines how safety-related policies and procedures are to be implemented and, to be effective, it must be integrated into everyday practice. It is now understood that accidents often have identifiable systemic causes at the organizational level. SMS provides a framework through which organisations are not only aware of their safety management responsibilities but are also able to properly discharge them.

SMS is an evolution of the current internal quality assurance system. It combines components of that system creating a framework with leadership commitment, organizational structure and accountability, hazard identification and risk management, safety performance indicators, accident/incident investigations and remedial actions, and safety education, in a continuous safety cycle.

SMS rules will:

- require organisations to establish, implement and maintain an SMS appropriate to the size and complexity of the airport.
- be consistent with the CAR 84, ANO (AD) A.1 – Manual of Aerodrome Standards (MAS), Bangladesh and SMS requirements as set out in ICAO Annex 14, Volume I and Safety Management Manual (Doc. 9859);
- be outcome-based and non-prescriptive in how those outcomes are to be achieved, setting out at the organizational level the components and elements to be contained in the SMS;
- build on existing internal quality assurance system requirements, providing a framework for various elements of an SMS to be integrated.

2. Definitions

Accident:- An unintended event or sequence of events that cause death, injury, environmental or material damage.

Acceptable level of safety:- is the minimum degree of safety that must be assured by a system in actual practice.

Accountable Executive:- Means Director/Airport Manager, having final responsibility for the effective and efficient performance of the organization's SMS.

Active failures:- are generally the result of equipment faults or errors committed by personnel.

Change Management: - The capabilities and support required by an organization constantly evolving in response to the changing requirements of interested parties, a dynamic business environment and the process of continual improvement. Change may also require that there be associated cultural and behavioral adjustments within an organization. Where these are necessary they will take time and resources and must be led by management.

Critical safety information: - Is the type of information that staff and management need to be aware of, in order to do their job. Typically, this would include information like a change to a company procedure required as part of a safety risk treatment option

Defences: - Are actions or elements of a design put in place to reduce the likelihood or consequence of an event. Risk treatment will normally involve the introduction or enhancement of defences against a specific negative outcome.

Deficiency: - The result of lacking something essential; imperfect; defective. Such as hazards allowed to exist within a system result in a System Deficiency.

Director/Airport Manager:- Means a person with overall operational responsibility for a particular aerodrome.

Errors:- Actions or inactions by persons that have an adverse effect.

Event: - An incident or situation which occurs in a particular place during a particular interval of time.

Facility: - means premises being used, or to be used, for the operation of an aircraft on the aerodrome. These premises may be fixed or portable, and may include communication facilities.

Gap analysis:- The implementation of an SMS requires a service provider to conduct an analysis of its system to determine which component and elements of an SMS are currently in place and which components and elements must be added or modified to meet the implementation requirement. This analysis is known as Gap analysis, and it involves comparing the SMS requirement against the existing resources in the service provider.

Hazard: - A source of potential harm or a situation with a potential to cause loss.

Human Factors: - Human Factors involves the study of the human's capabilities, limitations, and behaviors and the integration of that knowledge into the design of systems to enhance the safety, performance and the general well being of the operators of the systems.

Incident:- An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.

Investigation: - An activity to determine and assess any risks associated with an event using the hazard assessment process.

Likelihood: - Used as a qualitative description of probability or frequency.

Mitigation: - The actions taken either to control, reduce or remove a hazard or to reduce the probability or the severity of a risk. The result of an action to make milder or less severe.

Monitor: - To check, supervise, observe critically, or record the progress of an activity or system on a regular basis in order to identify change.

Non-critical safety information: - Is the sort of safety information that staff and management only need a general awareness of as part of their job

Oversight:- Oversight is a mechanism to ensure that operators and operators maintain an acceptable level of safety in their operations.

Predictive:- Predictive navigation aids do not require a triggering event to take place in order to launch the safety data capture process. Routine operational data are continually captured, in real time. Predictive navigation aids are based upon the notion that safety management is best accomplished by trying to find trouble, not just waiting for it to show up. Therefore, predictive safety data capture systems aggressively seek safety information that may be indicative of emerging safety risks for a variety of sources.

Proactive:- Proactive navigation aids require a less serious triggering event, probably with little or no damaging consequences, to take place in order to launch the safety data capture process. Proactive navigation aids are based upon the notion that system failures can be minimized by identifying safety risks within the system before it fails, and taking the necessary actions to mitigate such safety risks. Mandatory and voluntary reporting systems, safety audits and safety surveys are examples of proactive navigation aids.

Probability: - The likelihood of a specific outcome.

Reactive:- Reactive navigation aids require a very serious triggering event, with oftentimes considerable damaging consequences, to take place in order to launch the safety data capture process. Reactive navigation aids are based upon the notion of waiting until "something breaks to fix it". They are most appropriate for situations involving failures in technology and/or unusual events. Reactive navigation aids are an integral part of mature safety management. The contribution of reactive navigation aids to safety management nevertheless depends on the extent to which the information they generate goes beyond the triggering causes of the event, and the allocation of blame, and includes contributory factors and findings as to safety risks. The investigation of accidents and serious incidents are examples of reactive navigation aids.

Risk: - The chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood.

Risk analysis: - A systematic use of available information to determine how often specified events may occur and the magnitude of their consequences.

Risk assessment: - The overall process of risk analysis and risk evaluation.

Risk evaluation: - The process used to determine risk management priorities by comparing the level of risk against predetermined standards, target risk levels or other criteria.

Risk identification: - The process of determining what can happen, why and how.

Risk level: - The level of risk calculated as a function of likelihood and consequence.

Risk management: - The culture, processes and structures that are directed towards the effective management of potential opportunities and adverse effects.

Safety: - The state in which the possibility of harm to persons or of property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and safety risk management.

Safety assessment:- Safety assessment is post-implementation monitoring to verify that the defined level of safety continues to be met.

Safety assurance:- Safety assurance is what the State perform with regard to the safety performance of its SSP and operators/service providers perform with regard to the safety performance of their SMS, including monitoring and measurement.

Safety audit:- Safety audit is what the State performs with regard to the structure of its SSP and the operators and service providers perform with regard to the structure of their SMS.

Safety Manager: - means a person with specific responsibilities under Aerodrome Operator's Manual

Safety Management System: - A systemic approach to managing safety including the necessary organizational structure, accountabilities, policies and procedures.

Safety Office:- Safety Office serves as a focal point for safety-related activities, acts as a repository for safety reports and information, and provides expertise on safety management to line managers.

Safety Performance Indicators:- are a measure (or metric) used to express the level of safety performance achieved in a system.

Safety Performance Targets:- the required level of safety performance for a system. A safety performance target comprises one or more safety performance indicators, together with desired outcomes expressed in terms of those indicators.

Safety policy:- Safety policy outlines the methods and processes that the organization will use to achieve desired safety outcomes, and it serves as a reminder as to ``how we do business here``.

Safety Requirements:- are operational procedures, technology, systems and programmes to which measures of reliability, availability, performance and/or accuracy can be specified.

Safety risk:- Safety risk is defined as the assessment, expressed in terms of predicted probability and severity, of the consequences of a haggard, taking as reference the worst foreseeable situation. Typically, safety risks are designated through an alphanumeric convention that allows for their measurement.

State Safety Programme:- An integrated set of regulations and activities aimed at improving safety.

Safety survey:- Safety surveys examine particular elements or procedures of a specific operation, such as problem areas or bottlenecks in daily operations, perceptions and opinions of operational personnel and areas of dissent or confusion . Safety surveys may involve the use of checklists, questionnaires and informal confidential interviews.

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

Short Term Corrective Actions: - Short term Corrective Actions are those which the Safety Manager considers can be completed within 2 months of the receipt of report.

System descriptions:-

Works Safety Officer: - means a person responsible for the safety of works undertaken on an aerodrome.

Violation:- A result of deficient or unrealistic procedures where people have developed workarounds to accomplish the task.

3. Scope and applicability

- 3.1 Rule 260A (15) of CAR 84 requires that the operator of a certified aerodrome shall implement a safety management system, acceptable to the Chairman as a minimum:
- (a) identifies safety hazards;
 - (b) ensures that remedial action 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.

- 3.2 In order to be acceptable to Chairman, aerodrome operator's SMS shall meet the requirements set forth in this ANO.
- 3.3 Rule 260C (8) of CAR 84 requires aerodrome operators to establish safety management system of the aerodrome describing the structure of the organization and the duties, powers and responsibilities of the officials in the organizational structure, with a view to ensuring that operations are carried out in demonstrably controlled way and are improved where necessary.
- 3.4 This ANO describes the requirements for aerodrome operator's safety management system operating in accordance with ANO (AD) A.1 – Manual of Aerodrome Standards, Bangladesh.
- 3.5 This ANO addresses aviation safety related processes and activities rather than occupational safety, environmental protection, or customer service quality.
- 3.6 An aerodrome operator is responsible for the safety of services or products contracted to or purchased from other organizations.
- 3.7 This ANO establishes the minimum acceptable requirements. The aerodrome operator can establish more stringent requirements.

4. General

- 4.1 Aerodrome operator shall establish, maintain and adhere to a safety management system (SMS) that is appropriate to the size, nature and complexity of the operations authorized to be conducted under its aerodrome certificate and the safety hazards and risks related to the operations.

5. Safety Policy and Objectives

5.1 Safety policy

- 5.1.1 An aerodrome operator shall define the organization's safety policy.
- 5.1.2 The safety policy shall be signed by the accountable executive of the organization.
- 5.1.3 The safety policy shall be in accordance with all applicable legal requirements and international standards, best industry practices and shall reflect organizational commitments regarding safety.
- 5.1.4 The safety policy shall be communicated, with visible endorsement, throughout the organization.
- 5.1.5 The safety policy shall include a clear statement about the provision of the necessary human and financial resources for its implementation.
- 5.1.6 The safety policy shall, *inter alia*, include the following objectives:

- 5.1.6.1 commitment to implement an SMS;
 - 5.1.6.2 commitment to continual improvement in the level of safety;
 - 5.1.6.3 commitment to the management of safety risks;
 - 5.1.6.4 commitment to encourage employees to report safety issues;
 - 5.1.6.5 establishment of clear standards for acceptable behaviour; and
 - 5.1.6.5 identification of responsibilities of management and employees with respect to safety performance.
- 5.1.7 The safety policy shall be reviewed periodically to ensure it remains relevant and appropriate to the organization.

5.2 Safety objectives

- 5.2.1 Aerodrome operator shall establish safety objectives for the SMS.
- 5.2.2 The safety objectives should be linked to the safety performance indicators, safety performance targets and safety requirements of the aerodrome operator SMS.

5.3 Organizational structure and responsibilities

- 5.3.1 An aerodrome operator shall identify an **Accountable Executive** to be responsible and accountable on behalf of the aerodrome operator for meeting the requirements of this ANO, and shall notify to the Chairman the name of the person.
- 5.3.2 The Accountable Executive shall be a single, identifiable person who, irrespective of other functions, shall have the ultimate responsibility for the implementation and maintenance of the SMS.
- 5.3.3 The Accountable Executive shall have:
- 5.3.3.1 full control of the human resources required for the operations authorized to be conducted under the aerodrome certificate;
 - 5.3.3.2 full control of the financial resources required for the operations authorized to be conducted under the aerodrome certificate;
 - 5.3.3.3 final authority over operations authorized to be conducted under the aerodrome certificate;
 - 5.3.3.4 direct responsibility for the conduct of the organization's affairs; and
 - 5.3.3.5 final responsibility for all safety issues.
- 5.3.4 An aerodrome operator shall establish the safety structure necessary for the implementation and maintenance of the aerodrome SMS.
- 5.3.5 An aerodrome operator shall identify the safety responsibilities of all members of senior management, irrespective of other responsibilities
- 5.3.6 Safety-related positions, responsibilities and authorities shall be defined, documented and communicated throughout the organization.

5.3.7 An aerodrome operator shall identify a Safety Manager to be the member of management who shall be the responsible individual and focal point for the development and maintenance of an effective SMS.

5.3.8 The Safety Manager shall:

- (a) ensure that processes needed for the SMS are established, implemented and maintained;
- (b) report to the Accountable Executive on the performance of the SMS and on any need for improvement; and
- (c) ensure safety promotion throughout the organization.

5.3.9 An aerodrome operator shall establish a Safety Office.

5.4 SMS implementation plan

5.4.1 An aerodrome operator shall develop and maintain an SMS implementation plan.

5.4.2 The SMS implementation plan shall be the definition of the approach the organization will adopt for managing safety in a manner that will meet the organization's safety needs.

5.4.3 The SMS implementation plan shall include the following:

- (a) safety policy and objectives;
- (b) safety planning,
- (c) system description;
- (d) gap analysis;
- (e) SMS components;
- (f) safety roles and responsibilities;
- (g) safety reporting policy;
- (h) means of employee involvement;
- (i) safety training;
- (j) safety communication;
- (k) safety performance measurement; and
- (l) management review of safety performance.

5.4.4 The SMS implementation plan shall be endorsed by **Accountable Executive** of the organization.

5.4.5 An aerodrome operator shall, as part of the development of the SMS implementation plan, complete a system description.

5.4.6 The system description shall include the following:

- (a) the system interactions with other systems in the air transportation system;
- (b) the system functions;
- (c) required human performance considerations of the system operation;
- (d) hardware components of the system;
- (e) software components of the system;
- (f) related procedures that define guidance for the operation and use of the system;
- (g) operational environment; and
- (h) contracted and purchased products and services.

5.4.7 An aerodrome operator shall, as part of the development of the SMS implementation plan, complete a gap analysis, in order to:

- (a) identify the safety arrangements and structures that may be already exist throughout an organization; and
- (b) determine additional safety arrangements required to implement and maintain the organization's SMS.

5.4.8 The SMS implementation plan shall explicitly address the coordination between the SMS of the aerodrome operator and the SMS of other organizations the aerodrome operator must interface with during the provision of services.

5.5 Coordination of emergency response planning

5.5.1 An aerodrome operator shall develop and maintain, or coordinate, as appropriate, an emergency response/contingency plan that shall ensure:

- (a) orderly and efficient transition from normal to emergency operations;
- (b) designation of emergency authority;
- (c) assignment of emergency responsibilities;
- (d) coordination of efforts to cope with the emergency; and
- (e) safe continuation of operations, or return to normal operations as soon as possible.

5.6 Documentation

5.6.1 An aerodrome operator shall develop and maintain SMS documentation, in paper or electronic form, to describe the following:

- (a) safety policy;
- (b) safety objectives;
- (c) SMS requirements, procedures and processes;

- (d) responsibilities and authorities for procedures and processes; and
 - (e) SMS outputs.
- 5.6.2 An aerodrome operator shall, as part of the SMS documentation, develop and maintain a safety management system manual (SMSM), to communicate the organization's approach to safety throughout the organization.
- 5.6.3 The SMSM shall document all aspects of the SMS, and its contents shall include the following:
- (a) scope of the safety management system;
 - (b) safety policy and objectives;
 - (c) safety accountabilities;
 - (d) key safety personnel;
 - (e) documentation control procedures;
 - (f) hazard identification and risk management schemes;
 - (g) safety performance monitoring;
 - (h) emergency response/contingency planning;
 - (i) management of change; and
 - (j) safety promotion.

6. Safety risk management

6.1 General

- 6.1.1 An aerodrome operator shall develop and maintain safety data collection and processing systems (SDCPS) that provide for the identification of hazards and the analysis, assessment and mitigation of safety risks.
- 6.1.2 An aerodrome operator's SDCPS shall include reactive, proactive and predictive methods of safety data collection.

6.2 Hazard identification

- 6.2.1 An aerodrome operator shall develop and maintain formal means for effectively collecting, recording, acting on and generating feedback about hazards in operations, which combine reactive, proactive and predictive methods of safety data collection. Formal means of safety data collection shall include mandatory, voluntary and confidential reporting systems.
- 6.2.2 The hazard identification process shall include the following steps:
- (a) reporting of hazards, events or safety concerns (Appendix – B);
 - (b) collection and storing the safety data;

- (c) analysis of the safety data; and
- (d) distribution of the safety information distilled from the safety data.

6.3 Risk management

- 6.3.1 An aerodrome operator shall develop and maintain a formal risk management process that ensures the analysis, assessment and mitigation of risks of consequences of hazards to an acceptable level (Appendix – C).
- 6.3.2 The risks of the consequences of each hazard identified through the hazard identification processes described in section 6.2 of this ANO shall be analysed in terms of probability and severity of occurrence, and assessed for their tolerability (Appendix – D).
- 6.3.3 The organization shall define the levels of management with authority to make safety risk tolerability decisions (Appendix – E).
- 6.3.4 The organization shall define safety controls for each risk assessed as tolerable (Appendix – F).

7. Safety assurance

7.1 General

- 7.1.1 An aerodrome operator shall develop and maintain safety assurance processes to ensure that the safety risks controls developed as a consequence of the hazard identification and risk management activities under section 6 achieve their intended objectives.
- 7.1.2 Safety assurance processes shall apply to an SMS whether the activities and/or operations are accomplished internally or outsourced.

7.2 Safety performance monitoring and measurement

- 7.2.1 An aerodrome operator shall, as part of the SMS safety assurance activities, develop and maintain the necessary means to verify safety performance of the organization in comparison with the approved safety policies and objectives, and to validate the effectiveness of implemented safety risk controls.
- 7.2.2 Safety performance monitoring and measurement means shall include the following:
 - (a) safety reporting;
 - (b) safety audits;
 - (c) safety surveys;
 - (d) safety reviews;
 - (e) safety studies; and
 - (f) internal safety investigations.

- 7.2.3 The safety reporting procedure shall set out the conditions to ensure effective safety reporting, including the conditions under protection from disciplinary/administrative action shall apply.

7.3 Management of change

- 7.3.1 An aerodrome operator shall, as part of the SMS safety assurance activities, develop and maintain a formal process for the management of change.
- 7.3.2 The formal process for the management of change shall:
- (a) identify changes within the organization which may affect established processes and services;
 - (b) describe the arrangements to ensure safety performance before implementing changes; and
 - (c) eliminate or modify safety risk controls that are no longer needed due to changes in the operational environment.

7.4 Continuous improvement of the safety system

- 7.4.1 An aerodrome operator shall, as part of the SMS safety assurance activities, develop and maintain formal processes to identify the causes of under-performance of the SMS, determine the implications in its operation, and to rectify situations involving below standard performance in order to ensure the continual improvement of the SMS.
- 7.4.2 Continuous improvement of the aerodrome operator SMS shall include:
- (a) proactive and reactive evaluations of facilities, equipment, documentation and procedures, to verify the effectiveness of strategies for control of safety risks; and
 - (b) proactive evaluation of the individuals' performance, to verify the fulfilment of safety responsibilities.

8. Safety promotion

8.1 General

- 8.1.1 An aerodrome operator shall develop and maintain formal safety training and safety communication activities to create an environment where the safety objectives of the organization can be achieved.

8.2 Safety training

- 8.2.1 An aerodrome operator shall, as part of its safety promotion activities, develop and maintain a safety training programme (Appendix – H & I) that ensures that personnel are trained and competent to perform the SMS duties.
- 8.2.2 The scope of the safety training shall be appropriate to the individual's involvement in the SMS.

8.2.3 The accountable executive shall receive safety awareness training regarding:

- (a) safety policy and objectives;
- (b) SMS roles and responsibilities; and
- (c) safety assurance.

8.3 Safety communication

8.3.1 An aerodrome operator shall, as part of its safety promotion activities, develop and maintain formal means for safety communication, to:

- (a) ensure that all staff is fully aware of the SMS;
- (b) convey safety critical information;
- (c) explain why particular safety actions are taken;
- (d) explain why safety procedures are introduced or changed; and
- (e) convey generic safety information.

8.3.2 Formal means of safety communication shall include:

- (a) safety policies and procedures;
- (b) news letters; and
- (c) bulletins.

9. Quality policy

9.1 An aerodrome operator shall ensure that the organization quality policy is consistent with, and supports the fulfilment of the activities of the SMS.

10. Implementation of the SMS

10.1 This ANO proposes, but does not mandate, a phased implementation of an aerodrome operator SMS, which encompasses four phases.

10.2 Phase 1

10.2.1 Phase 1 should provide a blueprint on how the SMS requirements will be met and integrated to the organization's work activities, and an accountability framework for the implementation of the SMS:

10.2.2 Identify the accountable executive and the safety accountabilities of managers;

10.2.3 Identify the person (or planning group) within the organization responsible for implementing the SMS;

- 10.2.4 Describe the system of certified aerodrome;
- 10.2.5 Conduct a gap analysis of the organization's existing resources compared with the national and international requirements for establishing an SMS;
- 10.2.6 Develop an SMS implementation plan that explains how the organization will implement the SMS on the basis of national requirements and international SARPs, the system description and the results of the gap analysis;
- 10.2.7 Develop documentation relevant to safety policy and objectives; and
- 10.2.8 Develop and establish means for safety communication.

10.3 Phase 2

- 10.3.1 Phase 2 should put into practice those elements of the SMS implementation plan that refer to the safety risk management reactive processes:
 - (a) hazard identification and risk management using reactive processes;
 - (b) training relevant to:
 - (i) SMS implementation plan components; and
 - (ii) safety risk management (reactive processes).
 - (c) documentation relevant to:
 - (i) SMS implementation plan components; and
 - (ii) safety risk management (reactive processes).

10.4 Phase 3

- 10.4.1 Phase 3 should put into practice those elements of the SMS implementation plan that refer to the safety risk management proactive and predictive processes:
 - (a) hazard identification and risk management using proactive and predictive processes
 - (b) training relevant to:
 - (i) SMS implementation plan components; and
 - (ii) safety risk management (proactive and predictive processes).
 - (c) documentation relevant to:
 - (i) SMS implementation plan components; and
 - (ii) safety risk management (proactive and predictive processes).

10.5 Phase 4

10.5.1 Phase 4 should put into practice operational safety assurance:

- (a) development of acceptable level (s) of safety;
- (b) development of safety indicators and targets;
- (c) SMS continuous improvement;
- (d) training relevant to operational safety assurance; and
- (e) documentation relevant to operational safety assurance.

Appendix - A**Hazard Checklist****Aerodrome Name** _____

Hazard Checklist for Aerodromes SMS			
Hazard No	Hazard	Cause of Hazard	Consequence of Hazard
F	Aerodrome Facility		
F-1	Facilities do not meet legislated or safety requirements	Applicable standard not been adopted Current legislation or standard references not available Inadequate checklist and inspection schedules Poor quality of material and maintenance Poor design, construction and installation Inadequate training to access deficiencies	Aircraft Accident / Incident
A	Aerodrome Administration		
A-1	Unsafe or poor operated aerodrome environment	No formal structure Lack of human and other resources Lack of staff and management commitment Poor understanding of responsibilities Lack of training No clear lines of reporting Out-dated contact details	
E	Aerodrome Emergency Plan		
E-1	Inability to adequately response to an emergency	Lack of appropriate documented procedures Poor distribution of current procedures Lack of appropriate communication Lack of review of existing procedures through regular meetings, on after actual accident or incident Lack of testing of the procedures through exercises Lack of availability of equipment and personnel to combat an emergency situation Response agencies not being familiar with the aerodrome environment Remoteness of the aerodrome for response from agencies Contact details out of date	Loss of life / Damage to infrastructure Enforced closure of aerodrome
L	Aerodrome Lighting		
L-1	Failure of lighting system	Inadequate lighting for activity Lack of knowledge of standards applicable Below standard non-conforming facilities provided Poor maintenance Lack of appropriate checklist and maintenance schedules Unqualified or untrained personnel	Aircraft Accident / Incident Restriction to operations Full or partial closure of aerodrome Diversion of flights

Hazard Checklist for Aerodromes SMS			
Hazard No	Hazard	Cause of Hazard	Consequence of Hazard
		conducting maintenance Environmental conditions deteriorating equipment lenses, cables, sensitive equipment Infrequent serviceability inspections and poor reporting and remedial action arrangements Inadequate maintenance of records to detect trends	
L-2			
L-3			
L-4			
R	Aerodrome Reporting		
R-1	Aircraft operations being exposed to unreliable conditions	Incomplete or incorrect information relating to the published aerodrome information Lack of review of the documented information Information not reported Inadequate training of personnel responsible for the reporting arrangements Contact details outdated	Accidents / Incidents Operational restrictions Diversions
R-2			
R-3			
R-4			
U	Unauthorized Entry to Aerodrome		
U-1	Potential movement area incursion	Poor documented procedures Lack of adequate availability of facilities to prevent access either by humans or animals Lack of adequacy and suitability of resources No follow-up actions taken where security breaches are detected Poor surveillance procedures	Accident / Incident Disruption to operations Infrastructure damage
S	Aerodrome Serviceability Inspections		
S-1	Potential unsafe aerodrome facilities and conditions	Inadequate timing of inspections Poor inspection serviceability checklist Inadequate training of personnel responsible for the inspection process Poor record availability of inspections to detect trends Outdated contact arrangements Lack of communication Inappropriate training Lack of commitment by personnel responsible for the inspection function Lack of appropriate equipment to carry out the inspection Lack of remedial action and follow-up	Accident / Incident Disruption to operations Closure of movement area/s
T	Aerodrome Technical Inspections		
T-1	Potential non-compliant operation of facilities	Inspections not carried out to the required frequency Unqualified personnel carrying out the	Accidents / Incidents

Hazard Checklist for Aerodromes SMS			
Hazard No	Hazard	Cause of Hazard	Consequence of Hazard
		various inspection functions Inadequate inspection processes Inspections not carried out in accordance with the checklist Poor reporting of the inspection findings Aerodrome operator not following up on inspection findings and or recommendations	Failure of facilities Closure of facilities Suspension of aerodrome certificate
W	Aerodrome Works Safety		
W-1	Unsafe aviation operations. Potential accidents / incidents	Lack of training of personnel associated with the works function Poor planning of works Heavy aircraft schedules Poor communications Potential runway / runway incursions Facilities not left in a safe condition after a completed session of works Inadequate procedures for the marking of the designated works site Poor markings of the works equipment Poor identification of the works safety officer	
P	Aircraft Parking Control		
P-1	Potential aircraft damage	Congestion due to poor apron parking planning and layout Inappropriate provision of wingtip clearances for aircraft type Poorly maintained apron markings Non distribution of apron parking arrangements to operators Lack of training to ground staff	
P-2	Ground services equipment damage	Lack of adequate ground markings Poor design Poor Training	
P-3	Passenger Safety	Lack of adequate ground markings Lack of supervision Poor design Lack of consultation with the aircraft operators	
P-4	Jet Blast	Poor Design Inadequate protection to passenger and public	
V	Airside Vehicle Control		
V-1	Vehicle/mobile equipment Accidents	Lack of knowledge Excessive speed Poor visibility Unsafe vehicle Complacency Poor documented procedures Lack of supervision Lack of training	Injury / loss of life Damage/ cost
V-2	Incursions	Lack of knowledge Lack of / fault in communication equipments Lack of supervision	Aircraft Accidents Disruption to operations
V-3	Unsafe vehicles operating airside	Lack of maintenance Conspicuity Non standard Uncontrolled authority to control airside	

Hazard Checklist for Aerodromes SMS			
Hazard No	Hazard	Cause of Hazard	Consequence of Hazard
V-4			
B	Bird and Animal Hazard Management		
B-1	Bird / Animal strikes	Lack of adequate surveillance procedures Poor harassment procedures / techniques Lack of appropriately trained staff Lack of appropriate harassment equipment Unidentified problem sites	
O	Obstacle Control		
O-1	Protected Airspace penetration	Lack of knowledge of protected airspace requirement Lack of adequate planning Lack of appropriate surveillance Lack of, or poor communication with industry of height limitations	
O-2	Accident	Lack of information about the location of structure Lack of marking or lighting structure Lack of monitoring and maintenance of penetrating structure	
D	Disabled Aircraft Removal		
D-1	Hazard on the movement area	Lack of equipment to remove the aircraft (Obstacle) Insufficient remaining runway for continued operations Non reporting of the obstacle on the runway	
H	Handling of Hazardous Materials		
H-1	Hazardous material not contained	Fuel spill Biological fuel escape Toxic chemical leakage Lack of / poor procedures Non adherence to procedures	Fire Contamination of environment by hazardous material
H-2	Fire	Fuel spill Lack of / poor procedures Non-adherence to procedures	Death / injury Damage to plant / equipment
R	Protection of Radar and Navigational Aids		
R-1	Unserviceable equipment for aircraft operations	Encroaching into restricted areas Unauthorized maintenance or digging in vicinity of aid Lack of appropriate security measures - fencing, signs Excessive vegetation growth or other obstacle	
LV	Low Visibility Operations		
LV-1	Aircraft accident	Lack of adequate documented procedures Lack of appropriate training for personnel conducting assessment Poor communication between assessor and ATC	
	Runway incursions	Lack of adequate procedures Poor communication Poor or lack of supervision	

Hazard Checklist for Aerodromes SMS			
Hazard No	Hazard	Cause of Hazard	Consequence of Hazard
N	Notified in AIP-En-route Supplement		
N-1	Unsafe aircraft operation, potential damage to aerodrome facilities	Incorrect published operational data Inadequate training of personnel Inadequate reporting arrangements Inadequate documented procedures / checklist	
OH	Other Hazards		
OH-1			
SMS	Safety Management System Hazards		
SMS-1	SMS does not identify or treat safety risks	Poorly documented SMS Poor understanding of SMS	

Appendix - B**Hazard Report Form**

Note:-The information supplied in this form will only be used to enhance safety. You may choose to not provide your name. If you do provide your name, upon receipt of this form your name and position will be removed and discarded. Under no circumstances will your identity be disclosed to any person in the airport or to any other organization, agency or person without your express permission.

When you have completed your part of the form, it should be given to the Aerodrome Safety Manager or any member of the Aerodrome Safety Committee.

Name of Aerodrome Operator _____

Name of Submitter

(do not include if Safety Manager is completing a confidential hazard report) _____

Position held

(do not include if Safety Manager is completing a confidential hazard report) _____

Date of Report _____

Type of information to be collected for this Hazard Report	Record details here	Procedural Hazard	Physical Hazard	Probability [Likelihood of recurrence]	Severity of Consequences
Aerodrome Facility					
Aerodrome Administration					
Aerodrome Emergency Plan					
Aerodrome Lighting					
Aerodrome Reporting					
Unauthorized Entry to Aerodrome					

Type of information to be collected for this Hazard Report	Record details here	Procedural Hazard	Physical Hazard	Probability [Likelihood of recurrence]	Severity of Consequences
Aerodrome Serviceability Inspections					
Aerodrome Technical Inspection					
Aerodrome Works Safety					
Aircraft Parking Control					
Aircraft Vehicle Control					
Bird and Animal Hazard Management					
Obstacle Control					
Disabled Aircraft Removal					
Handling of Hazardous Materials					
Protection of Radar and Navigational Aids					
Low Visibility Operations					
Particular of the Aerodrome to be notified in AIP-ERSA					
Safety Management System					

Note.- 1. Please indicate in the table, as per your opinion, what is the likelihood of a similar occurrence happening again, e.g.:

Likely
1 2 3 4 Rare
5

Note.- 2. Please indicate in the table, what do you consider could be the worse possible consequence if this occurrence did happen again, e.g.:

Catastrophic *Minor damage*

A *B* *C* *D* *E*

Recommendation as to how this hazard may be dealt with:

—

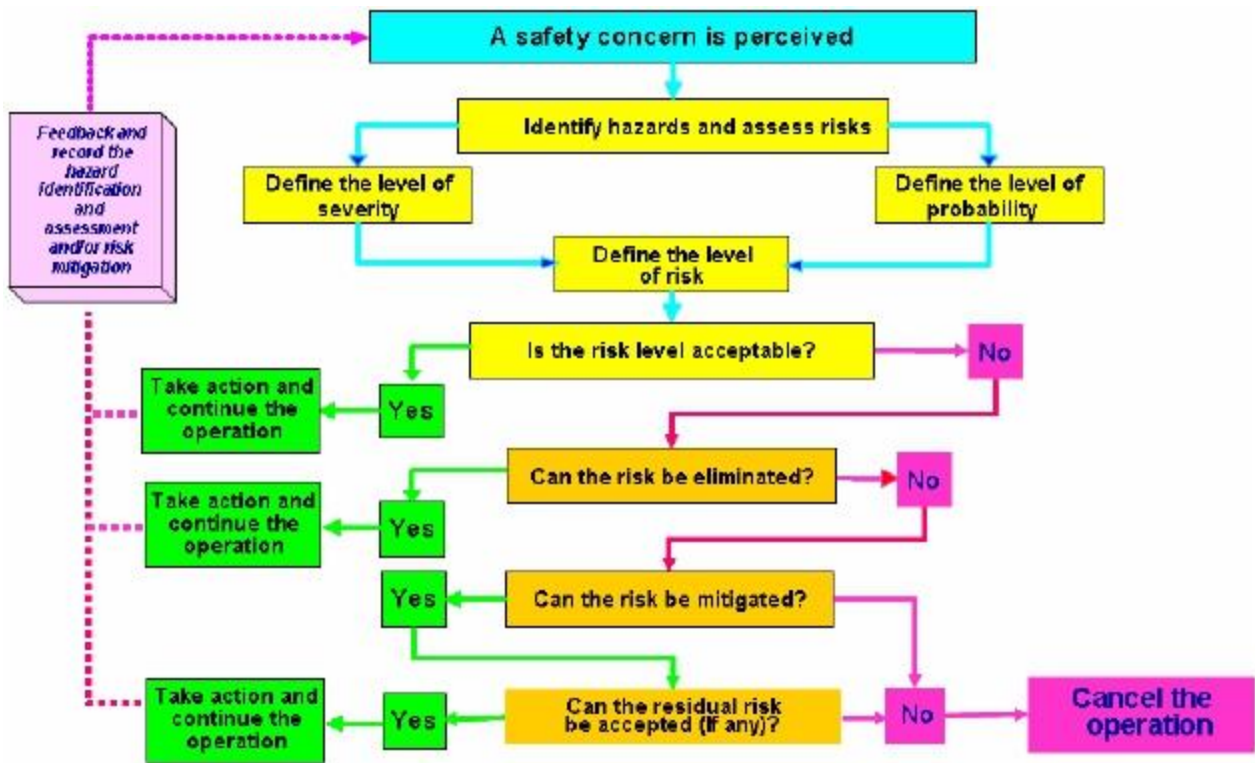
—

—

—

—

Risk Management Process



Appendix - D

Table 1: Risk Probability Table

Probability of occurrence		
Qualitative definition	Meaning (example)	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 2: Risk Severity Table

Severity of occurrences		
Aviation definition	Meaning	Value
Catastrophic	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 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

Appendix - E

Table 3: Risk Assessment Matrix (Risk Index)

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 4: Risk Acceptability Table

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

Appendix - F

Hazard Assessment Form**[TO BE COMPLETED BY THE AERODROME SAFETY MANAGER]**

The hazard report has been de-identified and entered into the company database

Signature: _____ Date: _____

Name _____

Assessment Requirement	Record details here	
Cause of Hazard (See Hazard checklist For suggested causes)	<input type="checkbox"/>	
Consequence of Hazard/Risk Description	<input type="checkbox"/>	
Current measures to reduce risks (Risk Treatments in place)		
	Consequence Level (Use Risk Severity Table)	Likelihood (Use Risk Probability Table)
Risk Index (Use Risk Assessment Matrix)	Risk Tolerability (Use Risk Acceptability Table)	
Further actions to reduce risks (Proposed risk mitigation measures)		
	Consequence Level (Use Risk Severity Table)	Likelihood (Use Risk Probability Table)
Risk Index (Use Risk Assessment Matrix)	Risk Tolerability/Residual Risk (Use Risk Acceptability Table)	

What action is required to ELIMINATE or CONTROL the hazard and PREVENT injury?

Resources Required: _____

Responsibility for action: _____

Referred to _____ for further action.

Signature: _____ Date: _____

Forwarded to the Aerodrome Safety Committee for review.

Signed: _____ Date: _____

Appropriate Feedback given to staff.

Signed: _____ Date: _____

Appendix – G

Hazard Report Log

Name of the Aerodrome Operator

(This Log contains a summary of data from Hazard Assessment Form, Appendix - F)

[illegible]

1. The data to go under this heading is the Hazard number and Residual Risk Source for each Risk (data from Hazard Checklist).
2. The data to go under this heading is a description of the optional actions which might be taken to treat the identified risk. (etc for all headings)
3. The data to go under this heading is the identity of the most preferable option to treat the risk identified.
4. The data to go under this heading is a re-assessment of the residual risk after the preferred risk treatment option has been introduced.
5. In many cases the preferred treatment option has been selected after a formal or informal cost benefit analysis. Record the results here.
6. Identify the responsible manager who would be in the best position to treat the risk identified.
7. Insert here a proposed completion data for the preferred risk option, and any relevant stage. This may be based on practical consideration or on the residual risk associated with a particular hazard.
8. Is it expected data the actions will be completed within 2 months of the occurrence? If so mark "Yes" in this box, otherwise "No".
9. Who and how will feedback be provided to the Aerodrome Safety manager about the results of action undertaken to treat risk?

Appendix - HTraining Plan

Name of Aerodrome Operator _____

Name of Staff Member _____

Department (if Applicable) _____

Position _____

Training Courses	Year											
	January	February	March	April	May	June	July	August	September	October	November	December
(i) Accountable Manager in the areas of: - awareness of SMS roles and responsibilities, - safety policy, - SMS standards and - safety assurance;												
(ii) Line Managers/Directors in the areas of: - organizational safety standards and national regulations, - management commitment and responsibilities, and - safety assurance;												
(iii) Other Managers and Supervisors in the areas of: - safety process, - management commitment and responsibilities, - hazard identification and risk management and - the management of change;												
(iii) Operational personnel in the areas of: - SMS fundamentals, - organizational safety policy, - organizational SMS overview,												

Training Courses	Year											
	January	February	March	April	May	June	July	August	September	October	November	December
and - management commitment and responsibilities; - Hazard Identification/ Reporting; - Accident & Incident Reporting.												
(iv) SMS recurrent/ Refresher/ Advance Training: - Accident & Incident Reporting & Investigation; - Emergency Response;												
(vi) Other Trainings												
Manual Handling												
Aerodrome Emergency Plan												
Aerodrome Lighting												
Aerodrome Reporting												
Unauthorized Entry to Aerodrome												
Aerodrome Serviceability Inspections												
Aerodrome Technical Inspections												
Aerodrome Works Safety												
Aircraft Parking Control												
Airside Vehicle Control												
Bird and Animal Hazard Management												
Obstacle Control												
Disabled Aircraft Removal												
Handling of Hazardous Materials												
Protection of Radar and Navigational Aids												
Low Visibility Operations												

Appendix - ITraining Record

Name of Aerodrome Operator _____

Title of Course _____

Location (if applicable) _____

Date of Course _____

S. No.	Name of attendees and designation	Signature
Name of Trainers (Print):		Signature of Trainer
1.		
2.		

Appendix - I**Accident and Incident Report Form**

To be completed by the Aerodrome Safety Manager or senior representative of the Airside Operator for all accidents and incidents which would likely seriously endanger people, aircraft, vehicles, or equipment.

Name of person that completed this report: _____

Organization and Position: _____

Telephone number: _____

Date of Accident/Incident: _____

Time: _____

Location: _____

Date of Report: _____

Names of Witnesses**Witness 1**

Name: _____

Address: _____

Telephone: _____

Witness 2

Name: _____

Address: _____

Telephone: _____

Witness 3

Name: _____

Address: _____

Telephone: _____

Details

Details of the accident/incident: (Include details of people involved, aircraft, vehicles, and equipment. Include details of what took place that contributed to the accident /incident)

Details of any injuries:

Details of damage to aircraft/vehicles/equipment/facilities:

Appendix - K

Examples of Safety Performance Indicators and Targets for Aerodrome Operators

S. No.	Indicator	Safety Performance Target (incidents per 1000 movements) for CURRENT YEAR
1	Incidents/Accidents Involving Aircraft	Reduction by 20% (in comparison to average of LAST YEAR).
1.1	Passenger Handling Equipment	Reduction by 20%
1.2	Aircraft Loading Equipment	Reduction by 20%
1.3	Aircraft Servicing Equipment	Reduction by 20%
2	Damage to/by moving aircraft	Not to exceed 0.018
2.1	Another Aircraft	Not to exceed 0.001
2.2	Jet Blast	Not to exceed 0.001
2.3	A/C Marshaller/Follow Me	Not to exceed 0.001
2.4	Aircraft Manoeuvring	Not to exceed 0.003
2.5	Fixed Objects	Not to exceed 0.002
2.6	Parked Ground Equipment	Not to exceed 0.001
2.7	FOD	Not to exceed 0.003
2.8	Others	Not to exceed 0.006
3	Loss of separation between moving a/c and ...	
3.1	Another A/C	Not to exceed 0.001
3.2	Mobile Equipment/vehicle	Not to exceed 0.42
3.3	Fixed Object	Not to exceed 0.016
4	Property Equipment by Jet Blast	Not to exceed 0.003
5	Equipment to Equipment Damage	Not to exceed 0.1
6	Equipment to Facility Damage	Not to exceed 0.1
7	Injuries to staff or passengers	Not to exceed 0.106
7.1	Injuries to staff	Not to exceed 0.09
7.1.1	<i>Fatal</i>	0
7.1.2	<i>Severe</i>	Not to exceed 0.001
7.1.3	<i>Minor</i>	Not to exceed 0.09
7.2	Injuries to passengers	Not to exceed 0.106
7.2.1	<i>Fatal</i>	0
7.2.2	<i>Severe</i>	Not to exceed 0.0005
8	Runway Incursion	Not to exceed 0.023

S. No.	Indicator	Safety Performance Target (incidents per 1000 movements) for CURRENT YEAR
8.1	Category A	Not to exceed 0.0012
8.2	Category B	Not to exceed 0.007
8.3	Category C	Not to exceed 0.008
8.4	Category D	Not to exceed 0.008
9	Spillages	Reduction by 20%
9.1	Fuel Spillages	Reduction by 20%
9.2	Other Spillages needed clean up	Reduction by 20%

Notes:

- Runway Incursion Category A:** Separation decreases and participants take extreme action to narrowly avoid a collision, or the event results in a collision.
- Runway Incursion Category B:** Separation decreases but there is a significant potential for collision.
- Runway Incursion Category C:** Separation decreases and there is ample time and distance to avoid a potential collision.
- Runway Incursion Category D:** Little or no chance of a collision, but meets the definition of a runway incursion.

Appendix – L

An Aerodrome SMS