Advisory Circular

AC 139 & CAR-ANS-009-01-0

IMPLEMENTATION OF SAFETY MANAGEMENT SYSTEM (SMS) FOR AERODROME & ANS PROVIDERS

Aerodrome & Air Navigation Safety Oversight Office (AANSOO)
Office of the Director General
Civil Aviation Authority of the Philippines
Old MIA Road, Pasay City, 1300

September 2009

Advisory Circulars (AC) are intended to provide recommendations and guidance, illustrate a means-but not necessarily the only means- of complying with regulatory requirements, or to explain certain regulatory requirements by providing interpretative and explanatory materials.

CAAP will generally accept that when the provisions of an Advisory Circular have been met, compliance with the relevant regulatory obligations has been satisfied.

Where an AC is referred to in a "Note" within regulatory documentation, the AC remains as guidance material.

ACs should always be read in conjunction with the referenced regulations.

CONTENTS

1. REFERENCES

1.1 This document may refer to portions of the following:

- Republic Act. 9497
- CAR-ANS Part 10 B
- Administrative Order 139
- Manual of Standards for Aerodrome
- ICAO Annex 11
- ICAO Annex 14 Volume 14th Edition as amended

2. PURPOSE

2.1 The Republic of the Philippines has developed a system for regulating aerodromes as prescribed in AO 139. Aerodromes that have international operations, or domestic air transport operations by aircraft certified to carry more than 30 passengers are required to be certified, and part of the certification requirement is that certified aerodromes in the Republic of the Philippines are required to have an acceptable safety management system in place. Likewise, CAR-ANS Part10 B requires. as part of the CAAP Safety Programme, that an air traffic service provider implements a safety management system that as a minimum: identifies hazards, ensures the implementation of remedial action necessary to maintain agreed safety performance; provides for continuous monitoring and regular assessment of the safety performance; and aims a continuous improvement of the overall performance of the safety management system. This AC contains the guidance material in the SMS implementation (Appendix A).

3. STATUS OF THIS AC

3.1 ACs are numbered to reflect the regulatory basis, the serial number of the circular issued for that regulation and the revision status for that AC. In this case, the regulatory basis is AO 139 and CAR-ANS Part 10 B this is the first to be issued combining the regulatory requirements of both the AO 139 & CAR-ANS.

4. BACKGROUND

4.1. This AC specifies the guidelines in the implementation of the requirements for a service provider's safety management system (SMS) operating in accordance with Annex 11 — Air Traffic Services; and Annex 14 — Aerodromes, Volume I — Aerodrome.

It addresses aviation safety-related processes, procedures and activities rather than occupational safety, environmental protection, or customer service or product quality. The service provider is responsible for the safety of services or products contracted or subcontracted to, or purchased from, other organizations. An SMS is a management tool for the management of safety by an organization. The Annexes also establish that the SMS shall be accepted by the State and shall, as a minimum:

a) identify safety hazards;

b) ensure the implementation of remedial action necessary to maintain agreed safety performance;

c) provide for continuous monitoring and regular assessment of the safety performance; and

d) aim at continuous improvement of the overall performance of the safety management system.

5. APPLICABILITY

5.1 The overall responsibility for the implementation of an SMS rests with the aerodrome and air traffic service providers. The aerodrome and air traffic service providers are also responsible for compliance with the requirements of AO 139 at certified aerodromes and CAR-ANS respectively.

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September 2009

Appendix A

GUIDANCE IN THE IMPLEMENTATION OF SAFETY MANAGEMENT SYSTEM (SMS) FOR AERODROME & ANS SERVICE PROVIDERS

Aerodrome & ANS Safety Oversight Office
Office of the Director General, CAAP
September 2009

A-1

Foreword

This Implementation Procedures Guide has been developed to assist organizations with the implementation of their Safety Management System (SMS). The guide is designed to address a phased implementation approach. The phased approach will allow organizations the time they need to implement safety management in a planned, systematic way. It will also allow the civil aviation safety inspectors a means to effectively manage the workload associated with this program.

This guide will also provide information to assist organizations with the selection of an accountable executive.

The AANSOO will assist organizations wherever possible; however, the priority will be directed to organizations that are required through regulatory amendments, to implement a safety management system.

Acknowledgment is due to Transport Canada for most of the materials used in this document.

Further, acknowledgment is due to the following: Capt. John Slaughter, ICAO Aerodrome expert, Mr. Guillermo Iovino, ICAO Airworthiness expert, and ICAO USOAP Coordinator, for their expert advice and guidance in the development of this material.

The AANSOO Management & Staff.

September 2009

Table of Contents

IMPLEMENTATION PROCEDURES FOR SAFETY MANAGEMENT SYSTEMS

1.1 Purpose

This implementation procedures guide has been developed with a dual purpose, the first is to provide information to Aerodrome & ANS providers who are required to implement a Safety Management System (SMS) and the second is to provide information that will assist those organizations with the selection and appointment of an accountable executive.

The guide will offer information on the conduct of a gap analysis and creation of an implementation plan. It will also expand on the ICAO's phased-approach for SMS implementation. Several forms and examples are also included and can be used or amended to suit the needs of individual organizations.

This guide is intended as information only, if there is a discrepancy between this guide and the applicable regulations, standards or exemption, the regulation/ standard will take precedence.

1.2 Background

The CAAP, is committed to the implementation of safety management systems in civil aviation organizations. Systemic safety management is a principal aim of a sound aviation management program and a prime factor in the achievement of the goals set out in our enabling legislations, in the reduction of accidents and incidents and an increased level of public confidence in the Philippine air transportation system. The aim is to improve safety through proactive management rather than reactive compliance with regulatory requirements.

The CAAP, through the AANSOO, has developed a series of rules to introduce the regulatory requirements for SMS in civil aviation organizations. These rules are part of AO 139 of the Aerodrome Manual of Standards Aerodrome AO 139 and CAR-ANS Part XI. This guide will provide information for the implementation of all the SMS regulations.

Safety management focuses on organizational arrangements to promote a positive culture. The CAAP subscribes to the ICAO guidelines for a phased-approach to SMS implementation which is appropriate in providing a manageable series of steps for organizations to follow. Four implementation phases have been identified; each phase involves the introduction of specific SMS components and elements.

1.3 Safety Management Systems Framework

CAAP has developed an SMS framework that is outlined in Table A. This framework follows the same structure as the ICAO SMS model. The framework lists four components and corresponding elements.

Table A – This table is included for information purposes and as a reference for Phases 1 through 4.

Table A - SMS Framework

Component	Element	Phase
1. Safety Policy & Objectives	1.1 Management commitment and responsibility	1
	1.2 Safety accountabilities	1
	1.3 Appointment of key safety personnel	1
	1.4 Coordination of emergency response planning	1
	1.5 SMS documentation	1,2,3,4
2. Safety Risk Management	2.1 Hazard identification	2,3
	2.2 Safety Risk assessment and mitigation	2,3
3. Safety Assurance	3.1 Safety performance monitoring and measurement	4
	3.2 The management of change	4
	3.3 Continuous improvement of the SMS	4
4. Safety Promotion	4.1 Training and education	2,3,4
	4.2 Safety communication.	2,3,4

* *The SMS Documentation and Training elements are common to all phases and are implemented as they apply to the other components or elements in that phase.*

The implementation of the SMS requirements has been divided into four phases with each phase having specific requirements as detailed below.

1.3.1 PHASE I — PLANNING SMS IMPLEMENTATION

1.3.1.1 The objective of Phase I of SMS implementation is to provide a blueprint on how the SMS requirements will be met and integrated into the organization's work activities, as well as an accountability framework for the implementation of the SMS.

1.3.1.2 During Phase I, basic planning and assignment of responsibilities are established. Central to Phase I is the gap analysis. From the gap analysis, an organization can determine the current status of its safety management processes and can begin detailed planning for the development of further safety management processes. One significant output of Phase I is the SMS implementation plan.

1.3.1.3 At the completion of Phase I, the following activities should be finalized in such a manner that meets the expectations of the civil aviation oversight authority, as set forth in relevant requirements and guidance material:

a) Identify the Accountable Executive and the safety accountabilities of managers. This activity is based on Elements 1.1 and 1.2 of the ICAO SMS framework.

b) Identify the person (or planning group) within the organization responsible for implementing the SMS. This activity is based on Element 1.5 of the ICAO SMS framework.

c) Describe the system . This activity is based on Element 1.5 of the ICAO SMS framework.

d) Conduct a gap analysis of the organization's existing resources compared with the national and international requirements for establishing an SMS. This activity is based on Element 1.5 of the ICAO SMS framework .

e) 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. This activity is based on Element 1.5 of the ICAO SMS framework.

f) Develop documentation relevant to safety policy and objectives. This activity is based on Element 1.5 of the ICAO SMS framework.

g) Develop and establish means for safety communication. This activity is based on Element 4.2 of the ICAO SMS framework. During this phase, affected organizations are required to complete a copy of the Compliance Document (Appendix A) and forward this to their respective inspectors as applicable. Completion of the compliance document will satisfy the requirements

of CAR-ANS Part 10 B and is an essential element of the SMS implementation process ensuring that all affected organizations are aware of their regulatory responsibility.

1.3.1.4 The compliance document will identify the accountable executive. It will also identify the person within the organization who is responsible for implementing the SMS and will contain a statement committing the organization to implementing that system. In some organizations, the accountable executive and the person responsible for implementation of the SMS may be the same person.

1.3.1.5 In addition to completing the compliance document, affected organizations will;

(a) conduct a gap analysis of the organization's existing systems compared to the CAR-ANS SMS requirements; and

(b) develop an SMS implementation plan that clearly demonstrates to the AANSOO how the organization will implement their SMS based on the requirements of the exemption and the results of the gap analysis.

1.3.1.6 The plan will be jointly agreed to between AANSOO and the organization implementing the SMS. To be effective, the implementation plan will include milestones for critical items such as dates for development and submission of policies and procedures, training of staff and review by AANSOO. These milestone dates are important, as CAAP inspectors will use them to plan their implementation responsibilities and commitments. Both AANSOO and the affected organization shall coordinate and agree to any changes.

1.3.1.7 The compliance document, gap analysis and implementation plan shall be completed and submitted as a package within the time limitations specified. The AANSOO will review the submission and provide a response within 90 days.

1.3.1.8 AANSOO endorsement of the compliance document will indicate review of the gap analysis and agreement with the plan..

1.3. 2 PHASE II — REACTIVE SAFETY MANAGEMENT PROCESSES

1.3.2.1 The objective of Phase II is to implement essential safety management processes, while at the same time correcting potential deficiencies in existing safety management processes. Most organizations will have some basic safety management activities in place, at different levels of implementation and with different degrees of effectiveness.

1.3.2.1 These activities may include inspections and audits reports, analysis of information from accident reports and incident investigations, and employee reports. This phase aims at solidifying existing activities and developing those which do not yet exist. However, because forward-looking systems have yet to be developed and implemented, this phase is considered reactive. Towards the end of Phase I, the organization will be ready to perform coordinated safety analyses based on information obtained through reactive methods of safety data collection.

Guidance

1.3.2.2 At the completion of Phase I, the following activities should be finalized in such a manner that meets the expectations of the civil aviation oversight authority, as set forth in relevant requirements and guidance material.

a) Implement those aspects of the SMS implementation plan that involve safety risk management based on reactive processes. This activity is based on Elements 2.1 and 2.2 of the ICAO SMS framework.

b) Deliver training relevant to the SMS implementation plan components and to safety risk management based on reactive processes. This activity is based on Element 4.1 of the ICAO SMS framework .

c) Develop documentation relevant to the SMS implementation plan components and to safety risk management based on reactive processes. This activity is based on Element 1.5 of the ICAO SMS framework.

d) Develop and maintain formal means for safety communication. This activity is based on Element 4.2 of the ICAO SMS framework.

1.3.3 PHASE III — PROACTIVE AND/OR PREDICTIVE SAFETY MANAGEMENT PROCESSES

1.3.3.1 The objective of Phase III is to structure forward-looking safety management processes. Safety information management and analytical processes are refined. Towards the end of Phase III, the organization will be ready to perform coordinated safety analyses based on information obtained through reactive, proactive and/or predictive methods of safety data collection. 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.

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 from a variety of sources Predictive safety data collection systems are essentially statistical systems, whereby a considerable volume of operational data, which alone are largely meaningless, are collected and analyzed, and combined with data from reactive and proactive safety data collection systems. The aggregation of data thus leads to the development of a most complete intelligence that allows organizations to navigate around obstacles. Hazard reporting systems, flight data analysis and normal operations monitoring are examples of predictive. At the completion of Phase III, the following activities should be finalized in such a manner that meets the expectations of the civil aviation oversight authority, as set forth in relevant requirements and guidance material.

a) Implement those aspects of the SMS implementation plan that refer to safety risk management based on proactive and/or predictive processes. This activity is based on Elements 2.1 and 2.2 of the ICAO SMS framework.

b) Develop training relevant to the SMS implementation plan components and to safety risk management based on proactive and predictive processes. This activity is based on Element 4.1 of the ICAO SMS framework.

c) Develop documentation relevant to the SMS implementation plan components and to safety risk management based on proactive and predictive processes. This activity is based on Element 1.5 of the ICAO SMS framework.

d) Develop and maintain formal means for safety communication. This activity is based on Element 4.2 of the ICAO SMS framework.

1.3.3. 2 During this phase, in addition to meeting the requirements of Phase 2, certificate holders must demonstrate to the satisfaction of the AANSOO that they have the Proactive Process element of the Safety Oversight component in place. This requirement will also include documented policies, procedures and training for personnel with assigned duties under the SMS.

1.3.4. PHASE IV — OPERATIONAL SAFETY ASSURANCE

In this phase operational safety assurance is assessed through the implementation of periodic monitoring, feedback and continuous corrective action to maintain the effectiveness of safety risk controls under changing operational demands. At the end of Phase III, safety information management and analytical processes ensure sustenance of safe organizational processes over time and during periods of change in the operational environment.

1.3.4.1 At the completion of Phase III, the following activities should be finalized in such a manner that meets the expectations of the civil aviation oversight authority, as set forth in relevant requirements and guidance material:

a) Develop and agree on safety performance indicators, safety performance targets and SMS continuous improvement. This activity is based on Elements 1.1, 3.1, 3.2 and 3.3 of the ICAO SMS framework .

b) Develop training relevant to operational safety assurance. This activity is based on Element 4.1 of the ICAO SMS framework.

c) Develop documentation relevant to operational safety assurance. This activity is based on Element 1.5 of the ICAO SMS framework.

d) Develop and maintain formal means for safety communication. This activity is based on Element 4.2 of the ICAO SMS framework.

1.3.4.2 During this phase, in addition to meeting the requirements of Phases 3, certificate holders must demonstrate to the satisfaction of the AANSOO , that they have the following components in place:

(a) Operational Quality Assurance

(b) Emergency Preparedness and Response

(c) Training for personnel with assigned duties under the SMS that are relevant to the components and elements referred to in (a) and (b).

2.0 Gap Analysis and Implementation Plan

2.1 Phase one of SMS implementation requires affected organizations 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 the regulatory requirements. The review involves comparing the SMS requirements found in Parts 10 B of the CAR-ANS and AO139 against the existing systems in your organization. Part I – General Provisions, contains several rule changes that are common to all civil aviation organizations and should be included in the analysis.

2.2 AANSOO has developed a Safety Management Systems Assessment Guide, which will assist organizations in conducting their gap analysis. This guide lists all the SMS components and elements and includes criteria linked to the appropriate regulation or standard. The SMS Assessment Guide will be appended to the AANSOO Inspection & Audit Manual.

2. 3 A comprehensive gap analysis form is included in this guide as Appendix B-1. The form combines the criteria from the SMS Assessment Guide, as well as the applicable references to AO 139 of the Aerodrome Manual of Operations and the regulations and standards for Part XI of the CAR-ANS.

2.4 Organizations can use this format as a template to conduct their gap analysis or they can create their own provided they refer to the SMS Assessment Guide for the appropriate criteria for each component and element.

2.5 Each gap analysis question is designed for a "yes" or "no" response. If you respond with a "yes" answer you are indicating that your organization already meets the criteria for that particular SMS component or element. A "No" answer indicates that a gap exists between the stated criteria and your organization's policies, procedures or processes. If the response is '"yes", the next column of the gap analysis form can be used to indicate where (in organization documentation) the requirement is addressed. If the response is "no", the same column can be used to indicate how and/or where the policy, procedure or process will be further developed to bring the organization into compliance with the requirement.

2.6 Once the gap analysis is complete and fully documented, the items you have identified as missing or deficient will form the basis of your implementation plan. Organizations may format their implementation plan to suit their individual needs, however, a spreadsheet format or MS Project type layout is recommended for ease of viewing and tracking.

Each item will be assessed to determine how the organization will create or modify policies, procedures or processes to incorporate the required SMS components and elements. Components and elements can be grouped into larger projects and assigned to project manager(s) who will oversee the development and implementation of that project. Appendix D provides the guideline on the development of the implementation plan referenced from Doc. 9859 (Revised Ed.)...

2.7 Once complete, the compliance document, gap analysis and implementation plan will be submitted to your inspector. These documents will be reviewed in accordance with the requirements of the applicable SMS regulations and standards.

Circumstances that necessitate change(s) to the project plan must be communicated as soon as possible to the assigned inspector to gain agreement and ensure timely submission of required material. Periodic progress reporting is a key component of this process.

3.0 Accountable Executive

3.1 Coincident with the introduction of SMS regulations, organizations will also be required to appoint an accountable executive. The accountable executive will be a single, identifiable person within each organization who will assume full responsibility for performance of the organization's ongoing compliance with AO 139 and the CAR-ANS requirements. It is imperative that the correct person is identified as the accountable executive, and that the individual understands the roles and responsibilities associated with that position. This is not intended to be a position title without accountability.3.2. This guide includes a series of questions, to assist with the selection process. Once this person is determined, the questions will confirm the selected person is the correct choice. All questions must receive a 'yes' answer for the candidate to be acceptable.

Should any of the questions result in an organizational structure that does not result in the clear selection of an accountable executive, an appropriate candidate will be selected in consultation with the AANSOO. The nomination of the Accountable Executive will be validated during the next inspection, regulatory audit or safety management system assessment.

4.0 Assessment Protocol

The AANSOO SMS Assessment Protocol has been developed to give the CAAP a tool for systematically evaluating the state of Safety Management Systems. It is not meant to be an inspection or compliance audit, but rather, the assessment focuses on the effectiveness and efficiency of a management system and makes judgments on its performance.

Civil Aviation Safety Inspectors will use the tool for the review and acceptance of each organization's SMS. This protocol can also be used by affected organizations to "self assess" their program prior to review by the AANSOO.

5.0 Guidance Material

5. 1 ICAO has published several guidance materials to assist organizations with their SMS program. This information is available on the http://www.icao.org./SMS/menu.htm

5.1.1 Organizations are encouraged to review this site with emphasis on the following;

• Safety Management Systems for organizations embraced by Annexes 11 & 14

• Doc 9859 Revised Edition (2009)

6.0 Compliance Document

6.1 Part 1 form may be used to satisfy the notification and acceptance requirements of AO 139 and CAR-ANS Part 10 B. Organizations required to implement an SMS will also complete Parts 2 & 3 of this form.

6.1.1 This compliance document, or a similarly worded form, the gap analysis and implementation plan, must be submitted within the time specified by the organization's inspector for review.

A question list is included in this guide. They can be used to assist your organization in identifying the accountable executive. The questions list is designed to ensure that a person, and not a position, is identified as the accountable executive.

Part 1

I, declare myself to be the accountable executive for:

_____

_____

(Name, position, title and signature)

_____

For the following activities:

☐ Air Traffic Service ☐ Aerodrome

Part 2

Implementing the Safety Management will be the responsibility of:

_____

(Name, position and title)

Part 3

As accountable executive,

I am committing _____
(Name of Organization)

to implement the Safety Management System per the attached SMS Implementation Plan.

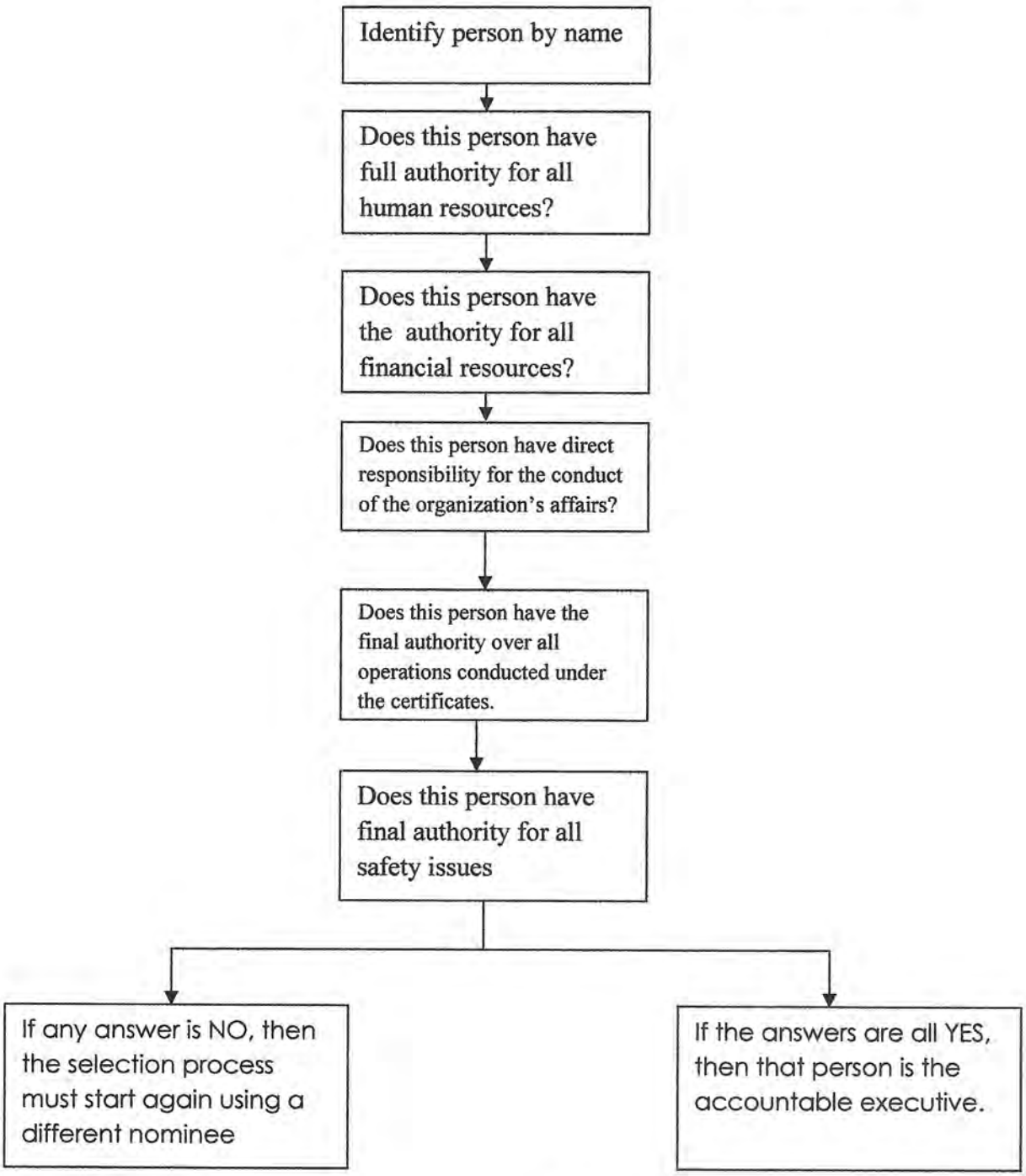
_____

(Accountable Executive)

The information contained in this document, the gap analysis, the SMS Implementation plan have been reviewed. Endorsement by the AANSOO indicates agreement with the attached implementation plan.

Signed: _____ _____
(For the Director General) Date

Part 4 Accountable Executive Selection Question List



Appendix 1 to Chapter 7

GUIDANCE ON SYSTEM DESCRIPTION

1. INTRODUCTION

1.1 A system description is the first prerequisite for the development of an SMS in an organization. Every system contains inherent potential safety vulnerabilities, which are characterized in terms of hazards. The hazard identification process can identify only hazards that come within the scope of the system description. The boundaries of the system, as per its formal description, must therefore be sufficiently wide to encompass all possible hazards that the system could confront or generate. In particular, it is important that the description includes the interfaces within the system, as well as the interfaces with the larger systems of which the system being assessed is a part.

1.2 A detailed description of the system should include:

a) the purpose of the system;

b) how the system will be used;

c) the system's functions;

d) the system's boundaries and the external interfaces; and

e) the environment in which the system will operate.

1.3 The safety consequences of a potential loss or degradation of the system will be determined, in part, by the characteristics of the operational environment in which the system will be integrated. The description of the environment should therefore include any factors that could have a significant effect on safety. These factors will vary from one organization to another. They could include, for example, air and ground traffic characteristics, aerodrome infrastructure and weather-related factors. The description of the system should also address contingency procedures and other non-normal operations, for example, failure of communications or navigation aids. An example of a system description of an aerodrome is detailed below.

2. SYSTEM DESCRIPTION OF AN AERODROME

A system description of an aerodrome should include facilities, equipment, personnel, processes and procedures necessary for the operation of the aerodrome. The different functions may include:

1. Operational management

1.1 Movement area access control

a) Air
b) Land
c) Sea

APPENDIX B

GAP ANALYSIS FORM

(Ref. SMM7 – APP 2-2)

3.2 The management of change
3.3 Continuous improvement of the SMS

4. Safety promotion

4.1 Training and education
4.2 Safety communication.

3. SMS GAP ANALYSIS FOR SERVICE PROVIDERS

The gap analysis checklist that follows can be used as a template to conduct a gap analysis. Each question is designed for a "Yes" or "No" response. A "Yes" answer indicates that the service provider already has the component or element of the ICAO SMS framework in question incorporated into its system and that it either matches or exceeds the requirement. A "No" answer indicates that a gap exists between the component/element of the ICAO SMS framework and the service provider's system.

ICAO reference	Aspect to be analysed or question to be answered	Answer	Status of implementation
Component 1 — SAFETY POLICY AND OBJECTIVES			
Element 1.1 — Management commitment and responsibility			
Chapter 8	Is there a safety policy in place?	☐ Yes ☐ No	
Chapters 3 and 8	Does the safety policy reflect organizational commitments regarding safety management?	☐ Yes ☐ No	
Chapters 3 and 8	Does the safety policy include a clear statement about the provision of the necessary resources for the implementation of the safety policy?	☐ Yes ☐ No	
Chapters 3 and 8	Does the safety policy include the safety reporting procedures?	☐ Yes ☐ No	
Chapter 8	Does the safety policy clearly indicate which types of operational behaviours are unacceptable?	☐ Yes ☐ No	
Chapter 8	Does the safety policy include the conditions under which disciplinary action would not apply?	☐ Yes ☐ No	
Chapter 8	Is the safety policy signed by the Accountable Executive?	☐ Yes ☐ No	
Chapter 8	Is the safety policy communicated, with visible endorsement, throughout the [organization]?	☐ Yes ☐ No	
Chapter 8	Is the safety policy periodically reviewed to ensure it remains relevant and appropriate to the [organization]?	☐ Yes ☐ No	
Chapter 8	Is there a formal process to develop a coherent set of safety objectives?	☐ Yes ☐ No	
Chapter 8	Are the safety objectives linked to the safety performance indicators, safety performance targets and action plans?	☐ Yes ☐ No	
Chapter 8	Are the safety objectives publicized and distributed?	☐ Yes ☐ No	

ICAO reference	*Aspect to be analysed or question to be answered*	*Answer*	*Status of implementation*
Element 1.2 — Safety accountabilities			
Chapters 8 and 10	Has the [organization] identified an Accountable Executive who, irrespective of other functions, shall have ultimate responsibility and accountability, on behalf of the [organization], for the implementation and maintenance of the SMS?	☐ Yes ☐ No	
Chapter 8	Does the Accountable Executive have responsibility for ensuring that the safety management system is properly implemented and performing to requirements in all areas of the [organization]?	☐ Yes ☐ No	
Chapter 8	Does the Accountable Executive have full control of the financial resources required for the operations authorized to be conducted under the operations certificate?	☐ Yes ☐ No	
Chapter 8	Does the Accountable Executive have full control of the human resources required for the operations authorized to be conducted under the operations certificate?	☐ Yes ☐ No	
Chapter 8	Does the Accountable Executive have direct responsibility for the conduct of the organization's affairs?	☐ Yes ☐ No	
Chapter 8	Does the Accountable Executive have final authority over operations authorized to be conducted under the operations certificate?	☐ Yes ☐ No	
Chapters 8 and 10	Has the organization identified the accountabilities of all members of management, irrespective of other functions, as well as of employees, with respect to the safety performance of the SMS?	☐ Yes ☐ No	
Chapter 8	Are the safety responsibilities, accountabilities and authorities documented and communicated throughout the [organization]?	☐ Yes ☐ No	
Chapter 8	Has the [organization] included a definition of the levels of management with authority to make decisions regarding safety risk tolerability?	☐ Yes ☐ No	
Element 1.3 — Appointment of key safety personnel			
Chapter 8	Has the organization appointed a qualified person to manage and oversee the day-to-day operation of the SMS?	☐ Yes ☐ No	
Chapter 8	Does the person overseeing the operation of the SMS fulfil the required job functions and responsibilities?	☐ Yes ☐ No	
Chapter 8	Are the safety authorities, responsibilities and accountabilities of personnel at all levels of the organization defined and documented?	☐ Yes ☐ No	
Element 1.4 — Coordination of emergency response planning			
Chapter 8	Does the [organization] have an emergency response/contingency plan appropriate to the size, nature and complexity of the organization?	☐ Yes ☐ No	
Chapter 8	Does the [organization] coordinate its emergency response/contingency procedures with the emergency/response contingency procedures of other organizations it must interface with during the provision of services?	☐ Yes ☐ No	
Chapter 8	Does the [organization] have a process to distribute and communicate the coordination procedures to the personnel involved in such interaction?	☐ Yes ☐ No	

ICAO reference	*Aspect to be analysed or question to be answered*	*Answer*	*Status of implementation*
Element 1.5 — SMS documentation			
Chapters 4 and 8	Has the [organization] developed and does it maintain a safety library for appropriate hazard documentation and documentation management?	☐ Yes ☐ No	
Chapters 4 and 8	Has the [organization] developed and does it maintain SMS documentation in paper or electronic form?	☐ Yes ☐ No	
Chapters 7, 8 and 10	Is the SMS documentation developed in a manner that describes the SMS and the consolidated interrelationships between all the SMS components?	☐ Yes ☐ No	
Chapters 8 and 10	Has the service provider developed an SMS implementation plan that ensures that the SMS meets the organization's safety objectives?	☐ Yes ☐ No	
Chapters 8 and 10	Has the SMS implementation plan been developed by a person or a planning group which comprises an appropriate experience base?	☐ Yes ☐ No	
Chapters 8 and 10	Has the person or planning group received enough resources (including time for meetings) for the development of the SMS implementation plan?	☐ Yes ☐ No	
Chapter 8	Is the SMS implementation plan endorsed by the senior management of the [organization]?	☐ Yes ☐ No	
Chapter 8	Is the SMS implementation plan regularly reviewed by the senior management of the [organization]?	☐ Yes ☐ No	
Chapters 8 and 10	Does the SMS implementation plan propose implementation of the SMS in phases?	☐ Yes ☐ No	
Chapter 8	Does the SMS implementation plan explicitly address the coordination between the service provider's SMS and the SMS of other organizations the [organization] must interface with during the provision of services?	☐ Yes ☐ No	
Chapter 8	Has the service provider developed a safety management systems manual (SMSM) as a key instrument for communicating the organization's approach to safety to the whole [organization]?	☐ Yes ☐ No	
Chapter 8	Does the SMSM document all aspects of the SMS including, among others, the safety policy, objectives, procedures and individual safety accountabilities?	☐ Yes ☐ No	
Chapter 8	Does the SMSM clearly articulate the role of safety risk management as an initial design activity and the role of safety assurance as a continuous activity?	☐ Yes ☐ No	
Chapter 8	Are relevant portions of SMS-related documentation incorporated into approved documentation, such as company operations manual, maintenance control/policy manual and airport operations manual, as applicable?	☐ Yes ☐ No	
Chapter 8	Does the service provider have a records system that ensures the generation and retention of all records necessary to document and support operational requirements?	☐ Yes ☐ No	
Chapter 8	Is the service provider's records system in accordance with applicable regulatory requirements and industry best practices?	☐ Yes ☐ No	

ICAO reference	*Aspect to be analysed or question to be answered*	*Answer*	*Status of implementation*
Chapter 8	Does the records system provide the control processes necessary to ensure appropriate identification, legibility, storage, protection, archiving, retrieval, retention time, and disposition of records?	☐ Yes ☐ No	
Component 2 — SAFETY RISK MANAGEMENT			
Element 2.1 — Hazard identification			
Chapters 3 and 9	Does the [organization] have a formal safety data collection and processing system (SDCPS) for effectively collecting information about hazards in operations?	☐ Yes ☐ No	
Chapters 3, 4 and 9	Does the [organization] SDCPS include a combination of reactive, proactive and predictive methods of safety data collection?	☐ Yes ☐ No	
Chapters 3, 9 and 10	Does the [organization] have reactive processes that provide for the capture of information relevant to safety and risk management?	☐ Yes ☐ No	
Chapters 9 and 10	Has the service provider developed training relevant to reactive methods of safety data collection?	☐ Yes ☐ No	
Chapters 9 and 10	Has the service provider developed communication relevant to reactive methods of safety data collection?	☐ Yes ☐ No	
Chapter 9	Is reactive reporting simple, accessible and commensurate with the size of the service provider?	☐ Yes ☐ No	
Chapters 9 and 10	Are reactive reports reviewed at the appropriate level of management?	☐ Yes ☐ No	
Chapter 9	Is there a feedback process to notify contributors that their reports have been received and to share the results of the analysis?	☐ Yes ☐ No	
Chapters 3, 9 and 10	Does the service provider have proactive processes that actively look for the identification of safety risks through the analysis of the organization's activities?	☐ Yes ☐ No	
Chapters 9 and 10	Is there training relevant to proactive methods of safety data collection?	☐ Yes ☐ No	
Chapters 9 and 10	Has the service provider developed communication relevant to proactive methods of safety data collection?	☐ Yes ☐ No	
Chapter 9	Is proactive reporting simple, accessible and commensurate with the size of the service provider?	☐ Yes ☐ No	
Chapters 3, 9 and 10	Does the service provider have predictive processes that provide the capture of system performance as it happens in real-time normal operations?	☐ Yes ☐ No	
Chapters 9 and 10	Is there training relevant to predictive methods of safety data collection?	☐ Yes ☐ No	
Chapter 9	Has the service provider developed communication relevant to predictive methods of safety data collection?	☐ Yes ☐ No	
Chapter 9	Is the predictive safety data capture process commensurate with the size of the service provider?	☐ Yes ☐ No	

ICAO reference	*Aspect to be analysed or question to be answered*	*Answer*	*Status of implementation*
Element 2.2 — Safety risk assessment and mitigation			
Chapters 9 and 10	Has the [organization] developed and does it maintain a formal process that ensures analysis, assessment and control of the safety risks in the [organization] operations?	☐ Yes ☐ No	
Chapters 4, 9 and 10	Does the [organization] SMS documentation clearly articulate the relationship between hazards, consequences and safety risks?	☐ Yes ☐ No	
Chapters 5 and 9	Is there a structured process for the analysis of the safety risks associated with the consequences of identified hazards, expressed in terms of probability and severity of occurrence?	☐ Yes ☐ No	
Chapters 5 and 9	Are there criteria for assessing safety risks and establishing safety risk tolerability (i.e. the acceptable level of safety risk the organization is willing to accept?	☐ Yes ☐ No	
Chapters 5 and 9	Does the service provider have safety risk mitigation strategies that include corrective/preventive action plans to prevent recurrence of reported occurrences and deficiencies?	☐ Yes ☐ No	
Component 3 — SAFETY ASSURANCE			
Element 3.1 — Safety performance monitoring and measurement			
Chapters 9 and 10	Has the [organization] implemented an internal process to verify the safety performance of the organization and to validate the effectiveness of safety risks controls?	☐ Yes ☐ No	
Chapter 9	Are the following tools included in those processes? Safety reporting systems ☐ Yes ☐ No Safety studies ☐ Yes ☐ No Safety reviews ☐ Yes ☐ No Safety audits ☐ Yes ☐ No Safety surveys ☐ Yes ☐No Internal safety investigations ☐ Yes ☐ No		
Chapters 6 and 9	Is the safety performance of the [organization] verified in reference to the safety performance indicators and safety performance targets of the SMS?	☐ Yes ☐ No	
Chapter 9	Are safety reports reviewed at the appropriate level of management?	☐ Yes ☐ No	
Chapter 9	Is there a feedback process to notify contributors that their reports have been received and to share the results of the analysis?	☐ Yes ☐ No	
Chapter 9	Are corrective and preventive actions generated in response to hazard identification?	☐ Yes ☐ No	
Chapter 9	Are there procedures in place for the conduct of internal investigations?	☐ Yes ☐ No	
Chapter 9	Is there a process to ensure that occurrences and deficiencies reported are analysed to identify all associated hazards?	☐ Yes ☐ No	
Chapter 9	Does the service provider have a process for evaluating the effectiveness of the corrective/preventive measures that have been developed?	☐ Yes ☐ No	
Chapter 9	Does the service provider have a system to monitor the internal reporting process and the associated corrective actions?	☐ Yes ☐ No	

ICAO reference	*Aspect to be analysed or question to be answered*	*Answer*	*Status of implementation*
Chapter 9	Is there an audit function with the independence and authority required to carry out effective internal evaluations?	☐ Yes ☐ No	
Chapter 9	Does the audit system cover all functions, activities and organizations within the service provider?	☐ Yes ☐ No	
Chapter 9	Are there selection/training processes to ensure the objectivity and competence of auditors as well as the impartiality of the audit process?	☐ Yes ☐ No	
Chapter 9	Is there a procedure for reporting audit results and maintaining records?	☐ Yes ☐ No	
Chapter 9	Is there a procedure outlining requirements for timely corrective and preventive action in response to audit results?	☐ Yes ☐ No	
Chapter 9	Is there a procedure to record verification of action(s) taken and the reporting of verification results?	☐ Yes ☐ No	
Chapter 9	Is there a process in place to monitor and analyse trends?	☐ Yes ☐ No	
Element 3.2 — The management of change			
Chapter 9	Has the [organization] developed and does it maintain a formal process to identify changes within the organization which may affect established processes and services?	☐ Yes ☐ No	
Chapter 9	Does the formal process for the management of change analyse changes to operations or key personnel for safety risks?	☐ Yes ☐ No	
Chapter 9	Has the [organization] established arrangements to ensure safety performance prior to implementing changes?	☐ Yes ☐ No	
Chapter 9	Has the [organization] established a process to eliminate or modify safety risk controls that are no longer needed due to changes in the operational environment?	☐ Yes ☐ No	
Element 3.3 — Continuous improvement of the SMS			
Chapter 9	Has the [organization] developed and does it maintain a formal process to identify the causes of substandard performance of the SMS?	☐ Yes ☐ No	
Chapter 9	Has the [organization] established a mechanism(s) to determine the implications of substandard performance of the SMS on operations?	☐ Yes ☐ No	
Chapter 9	Has the organization established a mechanism(s) to eliminate or mitigate the causes of substandard performance of the SMS?	☐ Yes ☐ No	
Chapter 9	Does the organization have a process for the proactive evaluation of facilities, equipment, documentation and procedures (through audits and surveys, etc.)?	☐ Yes ☐ No	
Chapter 9	Does the organization have a process for the proactive evaluation of an individual's performance, to verify the fulfilment of that individual's safety responsibilities?	☐ Yes ☐ No	
Component 4 — SAFETY PROMOTION			
Element 4.1 — Training and education			
Chapter 9	Is there a documented process to identify training requirements so that personnel are trained and competent to perform their SMS duties?	☐ Yes ☐ No	

ICAO reference	*Aspect to be analysed or question to be answered*	*Answer*	*Status of implementation*
Chapter 9	Is the safety training appropriate to the individual's involvement in the SMS?	☐ Yes ☐ No	
Chapter 9	Is the safety training incorporated into indoctrination training upon employment?	☐ Yes ☐ No	
Chapter 9	Is there emergency response/contingency training for affected personnel?	☐ Yes ☐ No	
Chapter 9	Is there a process that measures the effectiveness of training?	☐ Yes ☐ No	
Element 4.2 — Safety communication			
Chapter 9	Are there communication processes in place within the [organization] that permit the safety management system to function effectively?	☐ Yes ☐ No	
Chapter 9	Are there communication processes (written, meetings, electronic, etc.) commensurate with the size and scope of the service provider?	☐ Yes ☐ No	
Chapter 9	Is safety-critical information established and maintained in a suitable medium that provides direction regarding relevant SMS documents?	☐ Yes ☐ No	
Chapter 9	Is safety-critical information disseminated throughout the [organization] and is the effectiveness of safety communication monitored?	☐ Yes ☐ No	
Chapter 9	Is there a procedure that explains why particular safety actions are taken and why safety procedures are introduced or changed?	☐ Yes ☐ No	

APPENDIX C

SYSTEM DESCRIPTION

(Ref. SMM7- APP 1-1)

1.2 Aerodrome emergency planning

a) Emergency procedures manual
b) Emergency simulation practices

1.3 Rescue and fire fighting

a) Capability
    1) Equipment
    2) Foam/water/dry powder discharge rate
b) Facility maintenance
c) Staff training and experience
d) Equipment mobilization plan
e) Reduction of capability (notice)
f) Water hydrant system

1.4 Movement area inspection and maintenance

a) Aerodrome manual
b) Inspection forms
c) Maintenance

1.5 Visual aids maintenance

a) Inspections
b) Schedule

1.6 Construction management

a) Control of works
b) Site management

1.7 Apron safety management, including vehicle traffic

a) Rules and regulation for airside operations
b) Airside management
    1) Airside vehicle management
    2) Airside vehicle licence
    3) Vehicle examination
    4) Safety specification
    5) Aircraft servicing coordination
c) Equipment parking
d) Apron discipline
e) Push-back operations
f) Traffic signs and markings
g) Stand allocation
h) Aircraft damage control
i) Fuel spillage control
j) Vehicle and equipment damage control
k) Apron safety checklists including ramp activity audit
l) Contracted and subcontracted activities

1.8 Wildlife hazard management

a) Bird control management
b) Observation
c) Bird strike report management

1.9 Obstacle control

a) Airport boundary
b) Outside the airport
c) Runway strip
d) Regulation and survey
e) Approval of building construction under the flight path

1.10 Disabled aircraft removal

a) Equipment compatible with aircraft type
b) Maintenance for readiness
c) Deployment scheme
d) Establishment of outsourcing procedures/contact

1.11 Dangerous goods handling

a) Limitation of dangerous goods on aircraft
b) Storage and loading
c) Establishment of training programmes
d) Acceptance of dangerous goods by operators
e) Emergency response guidance for aircraft incidents involving dangerous goods

1.12 Low visibility and adverse weather operations

a) Procedures
b) Coordination with air traffic services
c) Responsibility of organizations involved

1.13 Radio navigation aids installations and maintenance

a) NOTAMS

2. Aerodrome management

2.1 Slots negotiation and allocation
2.2 Flight dispatch
2.3 Follow-me guidance and marshalling
2.4 Movement area management and stand allocation
2.5 Low visibility operations CAT II and CAT III
2.6 Control of traffic rules and licensing regulations
2.7 Cleaning, waste removal and pest control

3. Passenger/terminal building management

3.1 Management of passengers, baggage flow and facilities

3.2 Passengers and public information
3.3 VIP and CIP assistance
3.4 Left luggage
3.5 Porter assistance
3.6 Trolley management
3.7 Cleaning and pest control

4. Air traffic and aeronautical information and communications services

4.1 Air traffic control (aerodrome control under low visibility operations)
4.2 Flight information and alerting services
4.3 Aeronautical information services (international NOTAM office and pre-flight information service)
4.4 Aeronautical telecommunications services

5. Safety and security management

5.1 Implementation and monitoring of the SMS

a) Safety manager
b) Hazard identification and assessment of the consequences
c) Risks assessment, control and mitigation
d) Safety assurance
e) Safety action groups
f) Safety management systems manual (SMSM)

5.2 Implementation and monitoring of the security programme
5.3 Implementation and monitoring of the aerodrome emergency plan (AEP)
5.4 Processing of the applications for the issuance of access cards

APPENDIX D

SMS IMPLEMENTATION PLAN

Appendix 2 to Chapter 10

GUIDANCE ON THE DEVELOPMENT OF AN SMS IMPLEMENTATION PLAN FOR SERVICE PROVIDERS

BACKGROUND

1. This appendix provides guidance to assist service providers in developing an SMS implementation plan that defines their organization's approach to the management of safety. The SMS implementation plan shall be endorsed by senior management of the organization and developed on the basis of national regulations, International Standards and Recommended Practices (SARPs), the system description and the results of a gap analysis.

2. The development of an SMS implementation plan will also:

a) assist service providers in preparing a realistic strategy for the implementation of an SMS that will meet the organization's safety objectives;

b) provide a manageable series of steps to follow in implementing an SMS; and

c) provide an accountability framework for the implementation of the SMS.

3. A phased approach is proposed to assist in effectively managing the workload associated with SMS implementation. Each phase is based upon the introduction of specific elements of the ICAO SMS framework.

4. The timeline for the implementation of each phase shall be commensurate with the size of the organization and complexity of the services provided.

Note 1.— A model Gantt chart for the development of the SMS implementation plan is included in this appendix. This guidance is intended as a reference only, and it may need to be tailored to meet the needs of individual service providers. A project management file of the model Gantt chart can be downloaded from www.icao.int/fsix or www.icao.int/anb/safetymanagement.

Note 2.— Within the context of this appendix the term "service provider" refers to any organization providing aviation services. The term includes approved training organizations that are exposed to safety risks during the provision of their services, aircraft operators, approved maintenance organizations, organizations responsible for type design and/or manufacture of aircraft, air traffic service providers and certified aerodromes, as applicable.

SMS Implementation Plan

1. PHASE I — PLANNING SMS IMPLEMENTATION

1.1 ***The Accountable Executive***

- Identify the Accountable Executive and the person or planning group to develop the SMS implementation plan (discussed in Chapter 8).

1.2 ***System description and gap analysis*** (discussed in Chapter 7).

System description

- Perform the system description, which is the first prerequisite activity for the development of an SMS in an organization. It should include the interfaces within the system, as well as the interfaces with other systems in the air transportation system. Guidance on a system description is included in Appendix 1 to Chapter 7.

Gap analysis

- Perform a gap analysis, against the four components and twelve elements of the ICAO SMS framework, to identify existing safety arrangements within the organization and those that are missing. Guidance on the development of an SMS gap analysis is contained in Appendix 2 to Chapter 7.
- Based upon the results of the gap analysis, the person or planning group should be able to develop the SMS implementation plan taking into consideration:

  — the identification of potential gaps that may hinder SMS implementation; and
  — the development of strategies to address such gaps.

1.3 **Safety policy and objectives** (discussed in Chapter 8)

Safety policy

- Develop a safety policy.
- Have the Accountable Executive sign the safety policy.
- Communicate the safety policy, with visible endorsement, throughout the organization.
- Establish a review schedule for the safety policy to ensure it remains relevant and appropriate to the organization.

  An example of a safety policy statement can be found in Chapter 8.

Safety objectives

- Establish safety objectives for the SMS, by developing safety performance standards in terms of:

— safety performance indicators;
— safety performance targets; and
— action plans.

- Establish the SMS requirements for subcontractors:

  — establish a procedure to write SMS requirements into the contracting process; and
  — establish the SMS requirements in the bidding documentation.

1.4 **Safety accountabilities and appointment of key safety personnel**
(discussed in Chapter 8 of this manual)

SMS organizational structure

- Establish the safety services office.
- Appoint a safety manager as the responsible individual and focal point for the development and maintenance of an effective SMS.
- Assess and establish lines of communication between the safety services office and the Accountable Executive, the Safety Action Group (SAG) and the Safety Review Board (SRB).
- Ensure that the functional lines of communication are commensurate with the size of the organization and complexity of the services provided.
- Establish the Safety Review Board (SRB) chaired by the Accountable Executive.
- Appoint senior managers, including line managers responsible for functional areas, to the SRB.
- Assign appropriate strategic functions to the SRB.
- Establish the Safety Action Group (SAG).
- Appoint line managers and representatives of front-line personnel to the SAG.
- Assign appropriate tactical functions to the SRB.
- Document all safety responsibilities, accountabilities and authorities and communicate those throughout the organization, including a definition of the levels of management with authority to make decisions regarding safety risk tolerability.
- Develop a schedule of meetings for the safety services office to meet with the SRB and SAG as needed.

1.5 **Coordination of the emergency response plan (ERP)** (discussed in Chapter 8)

Internal coordination

- Review the outline of the ERP related to the delegation of authority and assignment of emergency responsibilities.
- Establish coordination procedures for action by key personnel during the emergency and the return to normal operations.

External coordination

- Identify external entities that will interact with the organization during emergency situations.
- Assess their respective ERPs.
- Establish coordination between the different ERPs.
- Incorporate the coordination among different ERPs in the organization's safety management systems manual (SMSM).

1.6 **SMS documentation** (discussed in Chapter 8)

SMS documentation

- Establish the mechanism to collect and store the SMS-specific records and documentation.
- Refer to all relevant and applicable national regulations and international standards.
- Develop guidelines for records management that includes the SMS implementation plan and the SMSM.

SMS implementation plan

- Appoint the person, or establish the planning group, responsible for the development of the SMS implementation plan.
- Collect all applicable documents that form the SMS implementation plan.
- Conduct regular meetings with senior management to assess progress.
- Allocate resources (including time for meetings) commensurate with the tasks at hand.
- Include significant items of the SMS implementation plan in the business plan of the organization.
- Identify the costs associated with the training and planning required for SMS implementation.
- Allocate time for the development and deployment of the SMS implementation plan among the different management layers of the organization.
- Draft a budget for SMS implementation.
- Approve the initial budget for SMS implementation.
- Submit the SMS implementation plan for endorsement by senior management.

Safety management systems manual (SMSM)

- Draft the SMSM to communicate the organization's approach to safety to the whole organization.
- Expand, review and amend the contents of the SMSM (which is a living document) as the phased approach of the SMS evolves.

1.7 **Safety promotion — Training** (discussed in Chapter 9)

Safety training

- Develop a documented process to identify training requirements.
- Develop a validation process that measures the effectiveness of training.
- Develop safety training considering:
  - — initial (general safety) job-specific training;
  - — indoctrination/initial training incorporating SMS, including Human Factors and organizational factors;
  - — recurrent training.
- Identify the costs associated with training.
- Organize and set up schedules for appropriate training for all staff according to their individual responsibilities and involvement in the SMS.
- Develop training files for each employee, including management.

1.8 **Safety promotion — Safety communication** (discussed in Chapter 9)

- Establish a means to convey organizational information on Phase I, including:
  - — safety newsletters, notices and bulletins;
  - — websites;
  - — email.

1.9 **Time frame for implementation, and deliverables**

The estimated time frame for implementation of Phase I could take from 1 to 6 months, depending on the size of the organization and complexity of the services provided.

Deliverables

1) Safety policy signed by the Accountable Executive.
2) Safety policy communicated to all staff.
3) System description completed.
4) Gap analysis completed.
5) SMS organizational structure in place.
6) SMS implementation plan approved.
7) Training on SMS planning phase delivered.

8) Initial draft of SMSM published.

9) Means to communicate safety issues established.

2. PHASE II — REACTIVE SAFETY MANAGEMENT PROCESSES

2.1 **Hazard identification and analysis based on reactive processes**
(discussed in Chapters 3, 4 and 9)

Hazard identification

- Identify the internal and external sources to be used in collecting reactive information on hazards.
- Implement a structured approach to the reactive identification of hazards.

2.2 **Safety risk management based on reactive processes**
(discussed in Chapters 5 and 9)

Safety risk assessment

- Develop and adopt a safety risk matrix relevant to the organization's operational environment.
- Develop safety risk matrix instructions and include them in the training programme.

2.3 **Training** (discussed in Chapter 9)

- Develop a safety training programme for front-line personnel, managers and supervisors on:
  - — the relevant SMS implementation plan components;
  - — hazard identification and safety risk management based on reactive processes (front-line personnel are trained on identification and reporting of hazards from triggering events, and supervisors are trained on hazard and safety risk management);
  - — the hazard reporting form/template.

2.4 **Documentation on reactive processes** (discussed in Chapters 4 and 9)

- Establish a safety library.
- Add information on reactive safety risk management processes to the SMSM. (Information on reactive safety risk management processes will be used at a later phase to establish safety performance indicators and targets.)
- Write requirements for hazard identification and safety risk management based on reactive processes into the bid documentation for contractors, if necessary, and notify contractors and subcontractors in writing.

2.5 **Safety promotion — Safety communication** (discussed in Chapter 9)

- Establish a means to convey organizational information on Phase II:

  — safety newsletters, notices and bulletins;
  — websites;
  — email.

2.6 **Time frame for implementation, and deliverables**

The estimated time frame for implementation of Phase II could take from 9 to 12 months, depending on the size of the organization and complexity of the services provided.

Deliverables

1) Safety library established.

2) Reactive safety management processes implemented.

3) Training relevant to SMS implementation plan components and safety risk management on reactive processes completed.

4) Safety-critical information based on safety data captured from reactive processes distributed to the organization.

3. PHASE III — PROACTIVE AND PREDICTIVE SAFETY MANAGEMENT PROCESSES

3.1 **Hazard identification and analysis based on proactive and predictive processes**
(discussed in Chapters 3, 4 and 9)

Hazard identification

- Identify the internal and external sources to be used in collecting proactive and predictive information on hazards.

- Implement a structured approach to the proactive and predictive identification of hazards.

3.2 **Safety risk management based on proactive and predictive processes**
(discussed in Chapters 5 and 9)

Safety risk assessment

- Develop and adopt a safety risk matrix relevant to the organization's operational environment.

- Develop safety risk matrix instructions and include them in the training programme.

3.3 **Training** (discussed in Chapter 9)

- Train staff of the safety services office on specific proactive and predictive means of collecting safety-related data.
- Brief supervisors and front-line personnel on proactive and predictive processes.
- Develop a safety training programme for front-line personnel, managers and supervisors on:
  - the relevant SMS implementation plan components;
  - hazard identification and safety risk management based on proactive and predictive processes (front-line personnel are trained on identification and reporting of hazards from less serious triggering events or during real-time normal operations, and supervisors are trained on hazard and safety risk management based on proactive and predictive processes).

3.4 **Documentation on proactive and predictive processes**
(discussed in Chapters 4 and 9 of this manual)

- Store information from safety risk management based on proactive and predictive processes in the safety library.
- Add information on proactive and predictive safety risk management processes to the SMSM.
- Develop safety performance indicators and safety performance targets.
- Write requirements for hazard identification and safety risk management based on proactive and predictive processes into the bid documentation for contractors, if necessary, and notify contractors and subcontractors in writing.

3.5 **Safety promotion — Safety communication** (discussed in Chapter 9)

- Establish a means to convey organizational information on Phase III:
  - safety newsletters, notices and bulletins;
  - websites;
  - email.

3.6 **Time frame for implementation, and deliverables**

The estimated time frame for implementation of Phase III could take from 12 to 16 months, depending on the size of the organization and complexity of the services provided.

Deliverables

1) Initial testing period for proactive and predictive means to collect hazard identification established.
2) Proactive and predictive safety management processes implemented.

3) Training relevant to SMS implementation plan components and safety risk management based on proactive and predictive processes completed.

4) Safety performance indicators and safety performance targets developed.

5) Critical safety information based on safety data captured by reactive, proactive and predictive processes distributed to the organization.

4. PHASE IV — OPERATIONAL SAFETY ASSURANCE

4.1 **Safety performance of the SMS** (discussed in Chapter 9)

- Establish safety performance indicators.
- Establish safety performance targets.
- Establish action plans.
- Define measures of reliability, availability and/or accuracy related to action plans, as required.
- Agree on safety performance measurement with the State oversight authority.

4.2 **Safety performance monitoring and measurement** (discussed in Chapter 9)

- Define and develop information sources for safety performance and monitoring.

4.3 **The management of change** (discussed in Chapter 9)

- Establish a formal process for the management of change that considers:
  - criticality of systems and activities;
  - stability of systems and operational environments;
  - past performance.
- Identify changes that might affect established processes, procedures, products and services.
- Prior to implementing changes, define arrangements to ensure safety performance.

4.4 **Continuous improvement of the SMS** (discussed in Chapter 9)

- Develop forms for internal evaluations and ensure independence from technical processes being evaluated.
- Define an internal audit process.
- Define an external audit process.

- Define a schedule for proactive evaluation of facilities, equipment, documentation and procedures, to be completed through audits and surveys.
- Define a schedule for proactive evaluation of an individual's performance.
- Develop documentation relevant to operational safety assurance.

4.5 **Training** (discussed in Chapter 9)

- Develop training relevant to operational safety assurance for staff involved in the safety assurance phase.

4.6 **Safety promotion — Safety communication** (discussed in Chapter 9)

- Establish a means to convey organizational information on Phase IV:
  - — safety newsletters, notices and bulletins;
  - — websites;
  - — email.

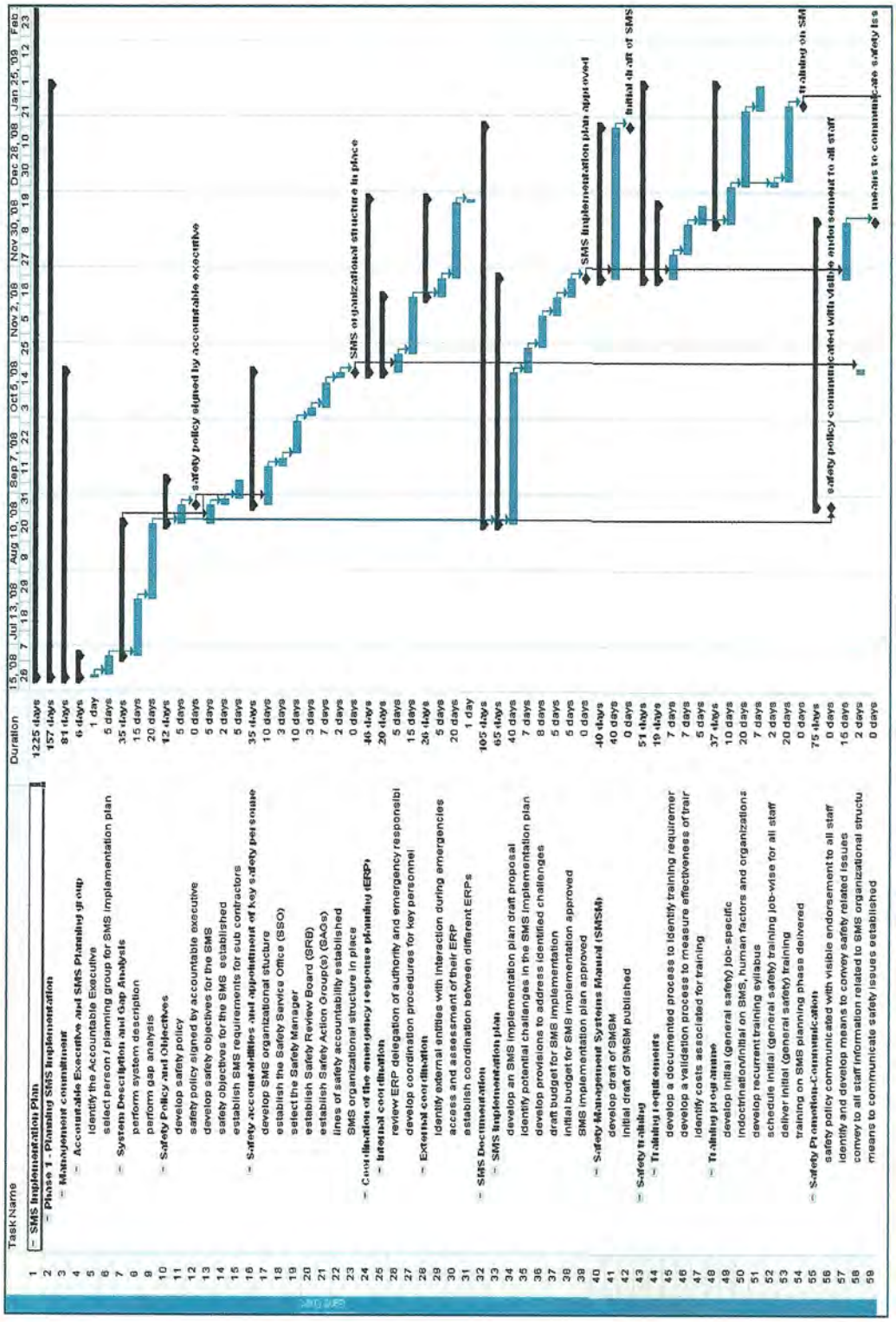
4.7 **Time frame for implementation and deliverables**

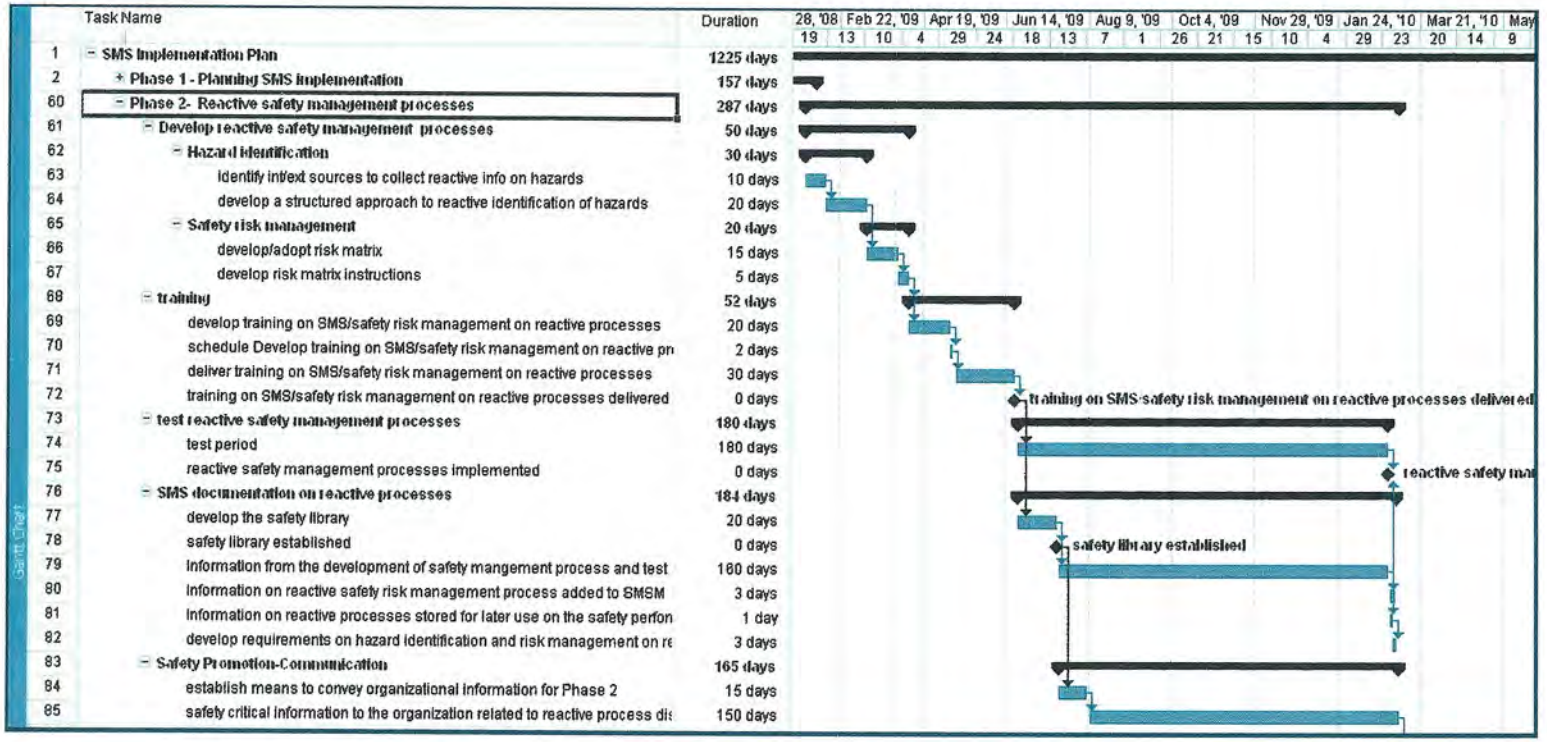
The estimated time frame for implementation of Phase IV could take from 9 to 12 months, depending on the size of the organization and complexity of the services provided.

Deliverables

1) Agreement reached with the State oversight authority on safety performance indicators and safety performance targets.
2) Training on safety assurance for operational personnel, managers and supervisors completed.
3) Documentation relevant to operational safety assurance placed in the safety library.

Gantt Chart — SMS Implementation Plan

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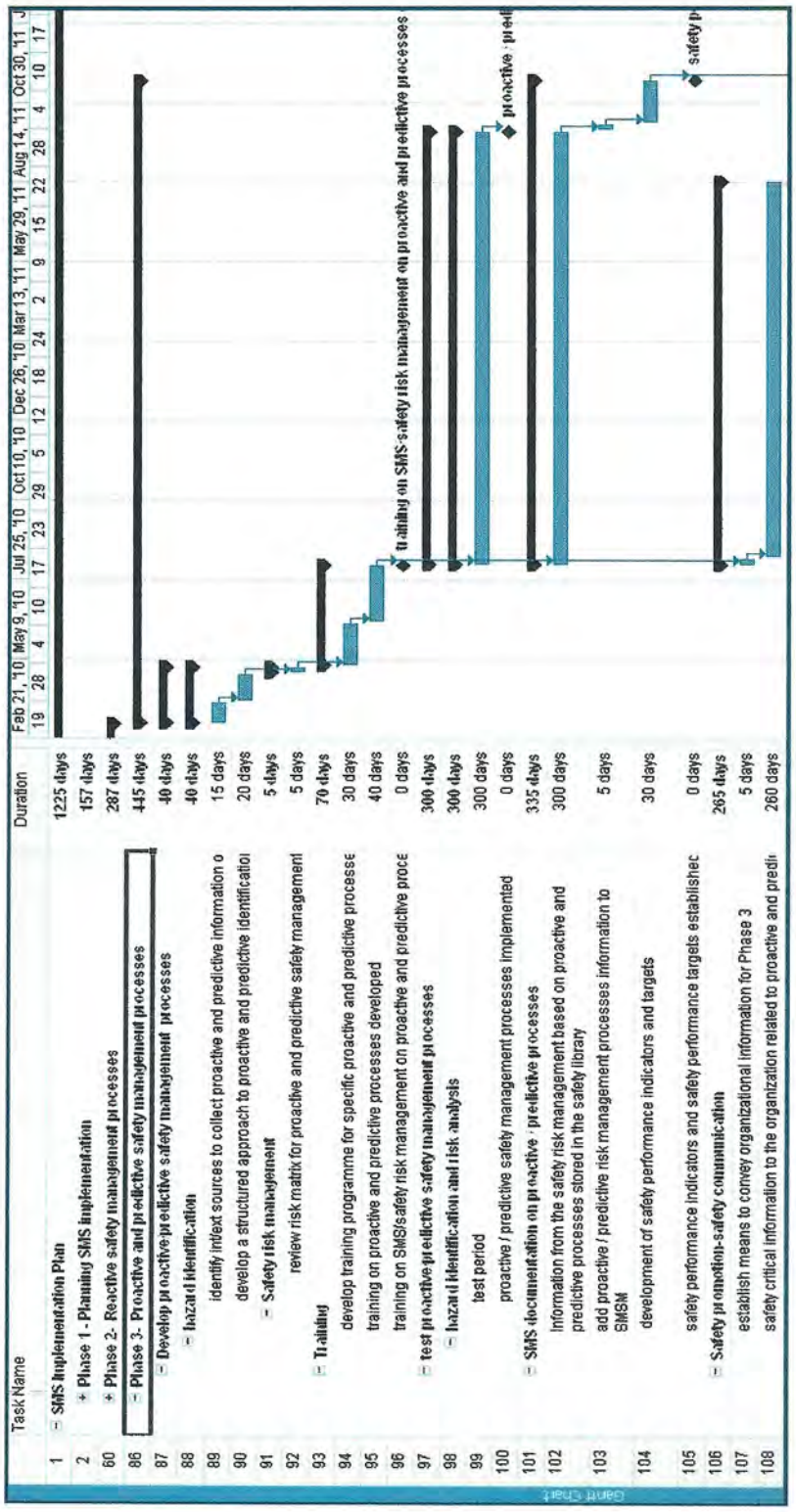
Duration
28, '08 Feb 22, '09 Apr 19, '09 Jun 14, '09 Aug 9, '09 Oct 4, '09 Nov 29, '09 Jan 24, '10 Mar 21, '10 May
19 13 10 4 29 24 18 13 7 1 26 21 15 10 4 29 23 20 14 9
1 SMS Implementation Plan 1225 days
2 Phase 1 - Planning SMS Implementation 157 days
60 Phase 2- Reactive safety management processes 287 days
61 Develop reactive safety management processes 50 days
62 Hazard identification 30 days
63 identify int/ext sources to collect reactive info on hazards 10 days
64 develop a structured approach to reactive identification of hazards 20 days
65 Safety risk management 20 days
66 develop/adopt risk matrix 15 days
67 develop risk matrix instructions 5 days
68 training 52 days
69 develop training on SMS/safety risk management on reactive processes 20 days
70 schedule Develop training on SMS/safety risk management on reactive pr 2 days
71 deliver training on SMS/safety risk management on reactive processes 30 days
72 training on SMS/safety risk management on reactive processes delivered 0 days
73 test reactive safety management processes 180 days
74 test period 180 days
75 reactive safety management processes implemented 0 days
76 SMS documentation on reactive processes 184 days
77 develop the safety library 20 days
78 safety library established 0 days
79 information from the development of safety mangement process and test 180 days
80 information on reactive safety risk management process added to SMSM 3 days
81 information on reactive processes stored for later use on the safety perfon 1 day
82 develop requirements on hazard identification and risk management on re 3 days
83 Safety Promotion-Communication 165 days
84 establish means to convey organizational information for Phase 2 15 days
85 safety critical information to the organization related to reactive process di 150 days
training on SMS/safety risk management on reactive processes delivered
reactive safety ma
safety library established
Gantt Chart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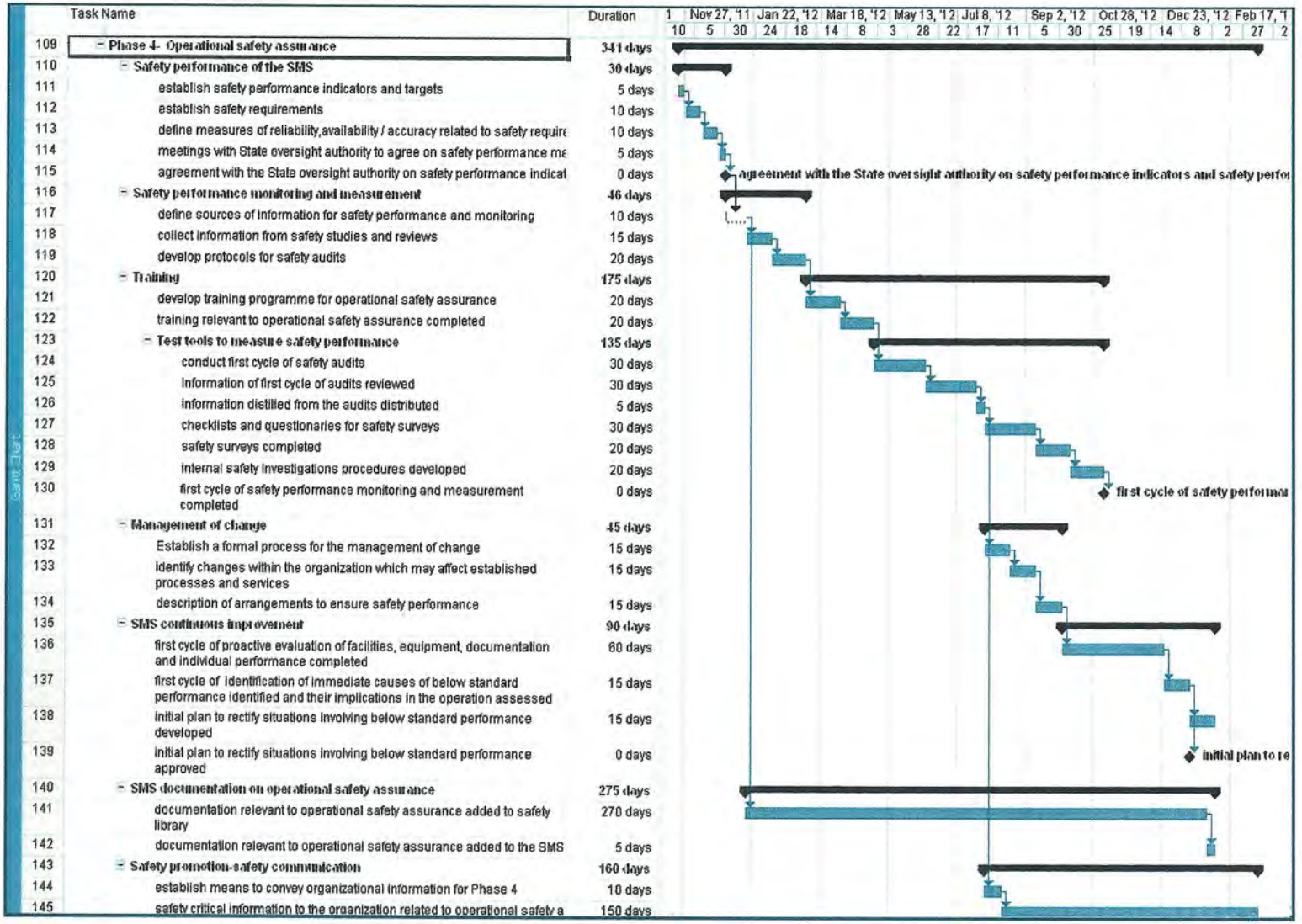
May 9, '10
Jul 25, '10
Oct 10, '10
Dec 26, '10
Mar 13, '11
May 29, '11
Aug 14, '11
Oct 30, '11
1 SMS Implementation Plan 1225 days
2 + Phase 1 - Planning SMS implementation 157 days
60 + Phase 2- Reactive safety management processes 287 days
86 - Phase 3- Proactive and predictive safety management processes 445 days
87 - Develop proactive-predictive safety management processes 40 days
88 - hazard identification 40 days
89 identify int/ext sources to collect proactive and predictive information o 15 days
90 develop a structured approach to proactive and predictive identificatio 20 days
91 - Safety risk management 5 days
92 review risk matrix for proactive and predictive safety management 5 days
93 - Training 70 days
94 develop training programme for specific proactive and predictive processe 30 days
95 training on proactive and predictive processes developed 40 days
96 training on SMS/safety risk management on proactive and predictive proce 0 days
97 - test proactive-predictive safety management processes 300 days
98 - hazard identification and risk analysis 300 days
99 test period 300 days
100 proactive / predictive safety management processes implemented 0 days
101 - SMS documentation on proactive - predictive processes 335 days
102 information from the safety risk management based on proactive and predictive processes stored in the safety library 300 days
103 add proactive / predictive risk management processes information to SMSM 5 days
104 development of safety performance indicators and targets 30 days
105 safety performance indicators and safety performance targets established 0 days
106 - Safety promotion-safety communication 265 days
107 establish means to convey organizational information for Phase 3 5 days
108 safety critical information to the organization related to proactive and predi 260 days
training on SMS-safety risk management on proactive and predictive processes
proactive - predi
safety p
Gantt Chart


Gantt Chart
Task Name
Duration
Nov 27, '11
Jan 22, '12
Mar 18, '12
May 13, '12
Jul 8, '12
Sep 2, '12
Oct 28, '12
Dec 23, '12
Feb 17, '1
109 Phase 4- Operational safety assurance 341 days
110 Safety performance of the SMS 30 days
111 establish safety performance indicators and targets 5 days
112 establish safety requirements 10 days
113 define measures of reliability,availability / accuracy related to safety require 10 days
114 meetings with State oversight authority to agree on safety performance me 5 days
115 agreement with the State oversight authority on safety performance indicat 0 days
116 Safety performance monitoring and measurement 46 days
117 define sources of information for safety performance and monitoring 10 days
118 collect information from safety studies and reviews 15 days
119 develop protocols for safety audits 20 days
120 Training 175 days
121 develop training programme for operational safety assurance 20 days
122 training relevant to operational safety assurance completed 20 days
123 Test tools to measure safety performance 135 days
124 conduct first cycle of safety audits 30 days
125 information of first cycle of audits reviewed 30 days
126 information distilled from the audits distributed 5 days
127 checklists and questionaries for safety surveys 30 days
128 safety surveys completed 20 days
129 internal safety investigations procedures developed 20 days
130 first cycle of safety performance monitoring and measurement completed 0 days
131 Management of change 45 days
132 Establish a formal process for the management of change 15 days
133 identify changes within the organization which may affect established processes and services 15 days
134 description of arrangements to ensure safety performance 15 days
135 SMS continuous improvement 90 days
136 first cycle of proactive evaluation of facilities, equipment, documentation and individual performance completed 60 days
137 first cycle of identification of immediate causes of below standard performance identified and their implications in the operation assessed 15 days
138 initial plan to rectify situations involving below standard performance developed 15 days
139 initial plan to rectify situations involving below standard performance approved 0 days
140 SMS documentation on operational safety assurance 275 days
141 documentation relevant to operational safety assurance added to safety library 270 days
142 documentation relevant to operational safety assurance added to the SMS 5 days
143 Safety promotion-safety communication 160 days
144 establish means to convey organizational information for Phase 4 10 days
145 safety critical information to the organization related to operational safety a 150 days
agreement with the State oversight authority on safety performance indicators and safety perfo
first cycle of safety performan
initial plan to re