香港特別行政區政府

民航處

Civil Aviation Department

The Government of the Hong Kong Special Administrative Region

CAD 712

Safety Management Systems (SMS)

For Air Operators, International Non-Public Transport Operators, Maintenance Organisations and Flying Training Organisations

A Guide to Implementation

ISSUE 2

MAY 2016

CHAPTER 1 INTRODUCTION 4
1.1. Purpose of this Guide 4
1.2. Definitions 5

CHAPTER 2 SAFETY MANAGEMENT FUNDAMENTALS 6
2.1 The concept of safety 6
2.2 Errors and violations 6
2.3 Safety culture 7
2.4 Change management 7
2.5 Effective safety reporting 8
2.6 Safety data collection and analysis 9
2.6.1 Safety data collection and quality 9
2.6.2 Safety database 10
2.6.3 Safety data analysis 11
2.6.4 Management of safety information 11
2.6.5 Protection of safety data 12
2.7 Safety indicators and performance monitoring 13
2.8 Acceptable level of safety performance (ALoSP) 14
2.9 Hazards 15
2.9.1 Hazard identification and prioritisation 15
2.9.2 Hazard identification methodologies 16
2.10 Safety risk 16
2.10.1 Definition of safety risk 16
2.10.2 Safety risk probability 16
2.10.3 Safety risk severity 17
2.10.4 Safety risk tolerability 18
2.10.5 Safety risk management 19
2.10.6 Risk management documentation 20
2.11 Emergency Response Plan (ERP) 20

CHAPTER 3 SAFETY MANAGEMENT SYSTEM 21

CHAPTER 4 SMS FRAMEWORK 22
SMS Component 1 Safety policy and objectives 22
SMS Element 1.1 Management commitment and responsibility 23
SMS Element 1.2 Safety accountabilities 23
SMS Element 1.3 Appointment of key safety personnel 24
SMS Element 1.4 Coordination of emergency response planning 24
SMS Element 1.5 SMS documentation 24
SMS Component 2 Safety risk management 25
SMS Element 2.1 Hazard identification 25
SMS Element 2.2 Safety risk assessment and mitigation 25
SMS Component 3 Safety assurance 26
SMS Element 3.1 Safety performance monitoring and measurement 26
SMS Element 3.2 The management of change 26
SMS Element 3.3 Continuous improvement of the SMS 27
SMS Component 4 Safety promotion 27
SMS Element 4.1 Training and education 27
SMS Element 4.2 Safety communication 28

CHAPTER 5 SMS IMPLEMENTATION 29
5.1 System description 29
5.2 Integration of management systems 29
5.2.1 SMS and QMS integration 29
5.3 Gap analysis 31
5.4 SMS implementation plan 31

CHAPTER 6 PHASED APPROACH 32

CHAPTER 7 CONCLUSION 35

CHAPTER 8 REFERENCES 35

APPENDIX A SAMPLE SAFETY POLICY STATEMENT 36

APPENDIX B GUIDANCE FOR THE DEVELOPMENT OF AN SMS MANUAL 38

APPENDIX C SMS GAP ANALYSIS CHECKLIST 48

APPENDIX D SMS INITIAL ACCEPTANCE CHECKLIST 55

CHAPTER 1 INTRODUCTION

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

A Safety Management System (SMS) is a systematic, proactive and explicit process for managing safety that integrates operations and technical systems with financial and human resource management to achieve safe operations with as low as reasonably practicable risk.

An SMS is *systematic* in that safety management activities are carried out in accordance with a pre-determined plan, and applied in a consistent manner throughout the organisation. It is *proactive* by taking an approach that emphasizes prevention, through hazards identification and risk control and mitigation measures, before events that affect safety occur. It is also *explicit*, in that all safety management activities are documented, visible and performed as an essential component of management activities.

It is an integrated system which includes the people, procedures, practices and technology needed to monitor and improve the safety of the aviation transportation system.

Safety management may be also described as the systematic application of specific technical and managerial skills to identify and control hazards and related risks. By identifying, assessing and eliminating or controlling safety-related hazards and risks, acceptable levels of safety can be achieved.

In this Guide, full account is taken of the need to maintain civil aviation operational safety risks as low as reasonably practicable. Civil Aviation Department (CAD) policies are incorporated and provide commonality of approach in terms of organisational SMS.

1.1. Purpose of this Guide

The purpose of this document is to provide guidance on the implementation of Safety Management Systems (SMS) for all Hong Kong Air Operator’s Certificate (AOC) Holders, HKAR-145 Approved Maintenance Organisations (AMO), Flying Training Organisations (FTO) as well as International Non-Public Transport Operators conducting operations of large or turbojet aeroplanes.

It has been developed to give sufficient understanding on SMS concepts and the development of management policies and processes to implement and maintain an SMS that meets ICAO requirements. Therefore, organisations are encouraged to refer to this document and ICAO Doc 9859 as their principal source of guidance to implement an effective SMS.

1.2. Definitions

Acceptable level of safety performance (ALoSP). The minimum level of safety performance of civil aviation in a State, as defined in its State safety programme, or of a service provider, as defined in its safety management system, expressed in terms of safety performance targets and safety performance indicators.

Accountable executive. A single, identifiable person having responsibility for the effective and efficient performance of the service provider's SMS.

Change management. A formal process to manage changes within an Organisation in a systematic manner, so that changes which may impact identified hazards and risk mitigation strategies are accounted for, before the implementation of such changes.

Defences. Specific mitigating actions, preventive controls or recovery measures put in place to prevent the realisation of a hazard or its escalation into an undesirable consequence.

Errors. An action or inaction by an operational person that leads to deviations from Organisational or the operational person's intentions or expectations.

High-consequence indicators. Safety performance indicators pertaining to the monitoring and measurement of high-consequence occurrences, such as accidents or serious incidents. High-consequence indicators are sometimes referred to as reactive indicators.

Lower-consequence indicators. Safety performance indicators pertaining to the monitoring and measurement of lower-consequence occurrences, events or activities such as incidents, non-conformance findings or deviations. Lower-consequence indicators are sometimes referred to as proactive/predictive indicators.

Risk mitigation. The process of incorporating defences or preventive controls to lower the severity and/or likelihood of a hazard's projected consequence.

Safety Management System (SMS). A systematic approach to managing safety, including the necessary organisational structures, accountabilities, policies and procedures.

Safety performance. Safety achievement as defined by its safety performance targets and safety performance indicators.

Safety Performance Indicator (SPI). A data-based parameter used for monitoring and assessing safety performance.

Safety Performance Target (SPT). The planned or intended objective for safety performance indicator(s) over a given period.

Safety risk. The predicted probability and severity of the consequences or outcomes of a hazard.

-CHAPTER 2 SAFETY MANAGEMENT FUNDAMENTALS

2.1 The concept of safety

Within the context of aviation, safety is 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.

While the elimination of aircraft accidents and/or serious incidents remains the ultimate goal, it is recognised that the aviation system cannot be completely free of hazards and associated risks. Human activities or human-built systems cannot be guaranteed to be absolutely free from operational errors and their consequences. Therefore, safety is a dynamic characteristic of the aviation system, whereby safety risks must be continuously mitigated. It is important to note that the acceptability of safety performance is often influenced by domestic and international norms and culture. As long as safety risks are kept under an appropriate level of control, a system as open and dynamic as aviation can still be managed to maintain the appropriate balance between production and protection.

2.2 Errors and violations

Effective SMS implementation by the product or service provider is dependent upon a clear, mutual understanding of errors and violations and the differentiation between the two. The difference between errors and violations lies in intent. While an error is unintentional, a violation is a deliberate act or omission to deviate from established procedures, protocols, norms or practices.

Errors or violations may result in non-compliance with regulations or approved operating procedures. Punitive measures taken in response to acts of non-compliance may lead to a reduction in the reporting of errors in the absence of other processes. Accordingly, the product or service provider must consider whether acts of non-compliance are the result of a violation or inadvertent error when determining whether punitive action is appropriate, with the criteria normally being whether non-compliance is the result of wilful misconduct or gross negligence.

2.3 Safety culture

A safety culture encompasses the commonly held perceptions and beliefs of an organisation's members pertaining to the public's safety and can be a determinant of the behaviour of the members. A healthy safety culture relies on a high degree of trust and respect between personnel and management and must therefore be created and supported at the senior management level.

A healthy safety culture actively seeks improvements, vigilantly remains aware of hazards and utilises systems and tools for continuous monitoring, analysis and investigation. Continuous improvement in safety performance involves effective hazard reporting, collaborative root-cause analysis and acceptable risk mitigation.

It is only possible when safety becomes a value within an organisation. This includes a shared commitment by personnel and management to personal safety responsibilities, confidence in the safety system, and a documented set of rules and policies. The ultimate responsibility for the establishment and adherence to sound safety practices rests with the management of the organisation. A safety culture cannot be effective unless it is embedded within an organisation's own culture.

2.4 Change management

Aviation organisations experience change due to expansion and contraction as well as changes to existing systems, equipment, policies, programmes, services and regulations. Hazards may inadvertently be introduced into the aviation system whenever change occurs. Existing baseline safety risk mitigation processes may also be impacted. Safety management practices require that hazards resulting from change be systematically identified, and strategies to manage the consequential safety risks be developed, implemented and subsequently evaluated. Sound management of safety risks associated with change is a critical requirement of the SMS.

2.5 Effective safety reporting

Accurate and timely reporting of relevant information related to hazards, incidents or accidents is a fundamental activity of safety management. The data used to support safety analyses are reported by multiple sources. One of the best sources of data is direct reporting by front-line personnel since they observe hazards as part of their daily activities. A workplace in which personnel have been trained and are constantly encouraged to report their errors and experiences is a prerequisite for effective safety reporting.

An effective safety reporting system can be illustrated in the following figure. (See Figure 1)

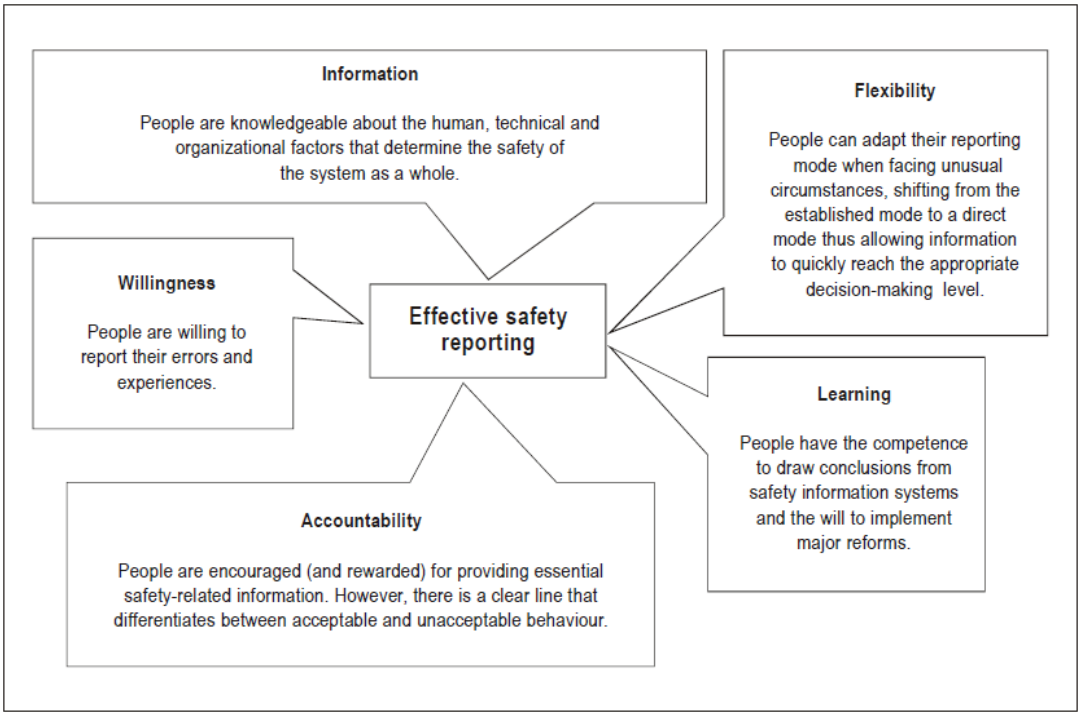

Figure 1.

2.6 Safety data collection and analysis

2.6.1 Safety data collection and quality

Data-based decision making is one of the most important facets of any management system. The type of safety data to be collected may include accidents and incidents, events, non-conformance or deviations and hazard reports. The quality of the data that are used to enable effective decision making must be considered throughout SMS development and implementation. Unfortunately, many databases lack the data quality necessary to provide a reliable basis for evaluating safety priorities and the effectiveness of risk mitigation measures. Failure to account for the limitations of data used in support of safety risk management and safety assurance functions will result in flawed analysis results that may lead to faulty decisions and discredit the safety management process.

Given the importance of data quality, organisations must assess the data used to support safety risk management and safety assurance processes using the following criteria:

(a) *Validity.* Data collected are acceptable as per established criteria for their intended use.

(b) *Completeness.* No relevant data are missing.

(c) *Consistency.* The extent to which measurement of a given parameter is consistent can be reproduced and avoids error.

(d) *Accessibility.* Data are readily available for analysis.

(e) *Timeliness.* Data are relevant to the time period of interest and available promptly.

(f) *Security.* Data are protected from inadvertent or malicious alteration.

(g) *Accuracy.* Data are error-free.

By considering these seven criteria for data quality, safety data analyses will generate the most accurate information possible to be used in support of strategic decision making.

2.6.2 Safety database

In the context of safety data collection and analysis, the term – safety database may include the following type of data or information which can be used to support safety data analysis:

(a) accident or incident investigation data;

(b) mandatory occurrence reports (MORs) data;

(c) voluntary reporting data*;

(d) continuing airworthiness reporting data;

(e) operational performance monitoring data;

(f) safety risk assessment data;

(g) data from audit findings/reports;

(h) data from safety studies/reviews, etc.

* Voluntary reports may come from operational personnel, but also from passengers or the general public.

The safety databases are typically housed in various parts of an organisation. Many organisations provide access to the databases through an interface that allows safety analysts to efficiently specify and extract reports of interest. Reports can be viewed individually or collectively through aggregation. Analytical tools allow safety analysts to view extracted data in multiple formats. Examples include spreadsheets, maps and various types of graphs.

To ensure that a database is understood and used appropriately, information related to the database must be well documented and made available to users. Types of such data may include field definitions, changes made to the database over time, usage rules, the data collection form and references to valid values.

2.6.3 Safety data analysis

After collecting safety data through various sources, organisations should then perform the necessary analysis to identify hazards and control their potential consequences. Among other purposes, the analysis may be used to:

(a) assist in deciding what additional facts are needed;

(b) ascertain root cause(s) or latent factor(s) underlying safety deficiencies;

(c) assist in reaching valid conclusions; and

(d) monitor and measure safety trends or performance.

Safety analysis is often iterative, requiring multiple cycles. It may be quantitative or qualitative. The absence of quantitative baseline data may force a reliance on more qualitative analysis methods.

It should be noted that human judgement may be subject to some level of bias based on past experiences, which may influence the interpretation of analysis results or testing of hypotheses. One of the most frequent forms of judgement error is known as – confirmation bias. This is the tendency to seek and retain information that confirms what one already believes to be true.

2.6.4 Management of safety information

Effective safety management is data driven. Sound management of the organisation's databases is fundamental to ensuring effective and reliable safety analysis of consolidated sources of data. The establishment and maintenance of a safety database provide an essential tool for personnel monitoring system safety issues.

Depending on the size and complexity of the organisation, system requirements may include a range of capabilities to effectively manage safety data. In general, the system should:

(a) include a user-friendly interface for data entry and query;

(b) have the capability to transform large amounts of safety data into useful information that supports decision making;

(c) reduce the workload for managers and safety personnel; and

(d) be managed at a relatively low cost.

To take advantage of the potential benefits of safety databases, a basic understanding of their operation is required. Safety data should preferably be stored in an electronic database that facilitates the query of records and generation of analysis output in a variety of formats.

The functional properties and attributes of different database management systems vary, and each should be considered before deciding on the most suitable system. Basic features should enable the user to perform such tasks as:

(a) log safety events under various categories;

(b) link events to related documents (e.g. reports and photographs);

(c) monitor trends;

(d) compile analyses, charts and reports;

(e) check historical records;

(f) share safety data with other organisations;

(g) monitor event investigations; and

(h) monitor the implementation of corrective actions.

2.6.5 Protection of safety data

Given the potential for misuse of safety data that have been compiled strictly for the purpose of advancing aviation safety, database management must include the protection of that data. Such database management must balance the need for data protection with that of making data accessible to those who can advance aviation safety. Protection considerations include:

(a) adequacy of “access to information” rights versus safety management requirements;

(b) organisational policies and procedures on the protection of safety data that limit access to those with a need to know;

(c) de-identification, by removing all details that might lead a third party to infer the identity of individuals (for example, flight numbers, dates/times, locations and aircraft type);

(d) security of information systems, data storage and communication networks;

(e) prohibitions on unauthorised use of data

(Ref. ICAO Doc 9859 3rd Edition Chapter 4 Appendix 5)

2.7 Safety indicators and performance monitoring

Analysis used to continuously monitor safety should, based on the periodic data extraction, be able to generate trends and updated on a regular basis (monthly or quarterly) serving as a continuous trend monitoring indicator. Once such a continuous trend monitoring indicator is in place, the next step is to transform it into a safety performance measurement indicator by setting target and alert levels accordingly. This step should preferably be done when historical data points have already been generated. These historical data points (historical performance) will be the basis for setting or defining unacceptable alert trend levels as well as any desired targeted improvement level to be achieved within a specified period.

An SMS defines measurable performance outcomes to determine whether the system is truly operating in accordance with design expectations and not simply meeting regulatory requirements. The *Safety Performance Indicators* (SPIs) are used to monitor known safety risks, detect emerging safety risks and to determine any necessary corrective actions.

SPIs also provide objective evidence for CAD to assess the effectiveness of the service provider's SMS and to monitor achievement of its safety objectives. The service provider's SPIs consider factors such as the organisation's safety risk tolerance, the cost/benefits of implementing improvements to the system, regulatory requirements and public expectations.

Such SPIs, together with the associated *Safety Performance Targets* (SPTs) and *alert levels* should be selected, developed and reviewed in consultation with CAD on a regular basis, as they are part of the regulatory requirements for the overall SMS CAD Acceptance. This process is necessary to facilitate CAD's aggregation and harmonisation of the service provider's SPIs and SPTs for the same aviation sector.

In practice, the safety performance of an SMS is expressed by safety performance indicators and their corresponding alert and target values. The service provider should monitor the performance of current indicators in the context of historical trends to identify any abnormal changes in safety performance. Likewise, target and alert settings should take into consideration recent historical performance for a given indicator. Desired improvement targets should be *realistic* and *achievable*.

2.8 Acceptable level of safety performance (ALoSP)

Establishing an alert level for a safety indicator is pertinent from a risk-monitoring perspective. An alert level is a common criterion to delineate the acceptable from the unacceptable performance regions for a particular safety indicator. As per generic safety metrics textbooks, a basic objective method for setting out-of-control alert criteria is the use of the standard deviation principle. This method takes into consideration the standard deviation and average values of the preceding historical data points for a given safety indicator. These two values are then used to establish the alert level for the next monitoring period of the indicator.

A range of *high-consequence* as well as *lower-consequence* SPIs provide a more comprehensive insight into the service provider's safety performance. This will ensure that *high-consequence* outcomes (e.g. accidents and serious incidents) as well as *lower-consequence* events (e.g. incidents, non-conformance reports, and deviations) are addressed. SPIs are essentially data trending charts that track occurrences in terms of *event rates* (e.g. number of incidents per 1 000 flying hours). *High-consequence* indicators should be addressed first while *lower-consequence* indicators may be developed at the more mature phase of SMS implementation.

Once safety performance indicators and their corresponding targets and alert settings have been defined, the performance outcome of each indicator should be updated and monitored on a regular basis. The *target and alert level* for each indicator may be tracked for their respective performance status. A consolidated summary of the overall target and alert performance outcome of the complete SPIs package may also be compiled or aggregated for a given monitoring period. Qualitative values (satisfactory/unsatisfactory) may be assigned for each target achieved and each alert level not breached. Alternatively, numeric values (points) may be used to provide a quantitative measurement of the overall performance of the package of indicators.

2.9 Hazards

2.9.1 Hazard identification and prioritisation

Hazard identification is a prerequisite to the safety risk management process. Any incorrect differentiation between hazards and safety risks can be a source of confusion. A clear understanding of hazards and their related consequences is essential to the implementation of sound safety risk management.

A hazard is generically defined by safety practitioners as a condition or an object with the potential to cause death, injuries to personnel, damage to equipment or structures, loss of material, or reduction of the ability to perform a prescribed function. For the purpose of aviation safety risk management, the term hazard should be focused on those conditions which could cause or contribute to unsafe operation of aircraft or aviation safety-related equipment, products and services.

Hazards are an inevitable part of aviation activities. They should be differentiated from error, a normal and unavoidable component of human performance, which must be managed. However, their manifestation and possible consequences can be addressed through various mitigation strategies to contain the potential for a hazard to result in unsafe aircraft or aviation equipment operations.

There is a common tendency to confuse hazards with their consequences or outcomes. A consequence is an outcome that can be triggered by a hazard. By first defining the hazard clearly, one can then project the proper consequence or outcome. It may be noted that consequences can be multi-layered, including such things as an intermediate unsafe event before an ultimate consequence (accident).

The damaging potential of a hazard materialises through one or many consequences. It is therefore important for safety assessments to include a comprehensive account of all likely consequences, described accurately and in practical terms. The description of consequences according to their plausible outcomes will facilitate the development and implementation of effective mitigation strategies through proper prioritisation and allocation of limited resources. Proper hazard identification leads to appropriate evaluation of their potential outcomes.

Hazards may be categorised according to their source or location. Objective prioritization of hazards may require categorisations according to the severity/likelihood of their projected consequences. This will facilitate the prioritisation of risk mitigation strategies so as to use limited resources in the most effective manner.

2.9.2 Hazard identification methodologies

The three methodologies for identifying hazards are:

(a) *Reactive.* This methodology involves analysis of past outcomes or events. Hazards are identified through investigation of safety occurrences. Incidents and accidents are clear indicators of system deficiencies and therefore can be used to determine the hazards that either contributed to the event or are latent.

(b) *Proactive.* This methodology involves analysis of existing or real-time situations, which is the primary job of the safety assurance function with its audits, evaluations, employee reporting, and associated analysis and assessment processes. This involves actively seeking hazards in the existing processes.

(c) *Predictive.* This methodology involves data gathering in order to identify possible negative future outcomes or events, analysing system processes and the environment to identify potential future hazards and initiating mitigating actions.

2.10 Safety risk

2.10.1 Definition of safety risk

Safety risk is the projected likelihood and severity of the consequence or outcome from an existing hazard or situation. While the outcome may be an accident, an "intermediate unsafe event/consequence" may be identified as "the most credible outcome". Provision for identification of such layered consequences is usually associated with more sophisticated risk mitigation software.

2.10.2 Safety risk probability

The process of controlling safety risks starts by assessing the probability that the consequences of hazards will materialise during aviation activities performed by the organisation. Safety risk probability is defined as the likelihood or frequency that a safety consequence or outcome might occur. The determination of likelihood can be aided by questions such as:

(a) Is there a history of occurrences similar to the one under consideration, or is this an isolated occurrence?

(b) What other equipment or components of the same type might have similar defects?

(c) How many personnel are following, or are subject to, the procedures in question?

(d) What percentage of the time is the suspect equipment or the questionable procedure in use?

(e) To what extent are there organisational, managerial or regulatory implications that might reflect larger threats to public safety?

Any factors underlying these questions will help in assessing the likelihood that a hazard may exist, taking into consideration all potentially valid scenarios. The determination of likelihood can then be used to assist in determining safety risk probability.

Figure 2 presents a typical safety risk probability/likelihood table, in this case, a five-point table. The table includes five categories to denote the probability related to an unsafe event or condition, the description of each category, and an assignment of a value to each category.

Level	*Descriptor*	*Likelihood description*
A	Certain/frequent	Is expected to occur in most circumstances
B	Likely/occasional	Will probably occur at some time
C	Possible/remote	Might occur at some time
D	Unlikely/improbable	Could occur at some time
E	Exceptional	May occur only in exceptional circumstances

Figure 2.

It must be stressed that this is an example only and that the level of detail and complexity of tables and matrices should be adapted to be commensurate with the particular needs and complexities of different organisations. Also, it should be noted that organisations may include both qualitative and quantitative criteria that may include up to fifteen values.

2.10.3 Safety risk severity

Once the probability assessment has been completed, the next step is to assess the safety risk severity, taking into account the potential consequences related to the hazard. Safety risk severity is defined as the extent of harm that might reasonably occur as a consequence or outcome of the identified hazard.

The severity assessment should consider all possible consequences related to an unsafe condition or object, taking into account the worst foreseeable situation. Figure 3 presents a typical safety risk severity table. It includes five categories to denote the level of severity, the description of each category, and the assignment of a value to each category. As with the safety risk probability table, this table is an example only.

Severity	*Meaning*	*Value*
Catastrophic	— Equipment destroyed — Multiple deaths	5
Major	— 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 — Major equipment damage	4
Moderate	— A significant reduction in safety margins, a reduction in the ability of the operators to cope with adverse operating conditions as a result of an increase in workload or as a result of conditions impairing their efficiency — Serious incident — Injury to persons	3
Minor	— Nuisance — Operating limitations — Use of emergency procedures — Minor incident	2
Negligible	— Few consequences	1

Figure 3.

2.10.4 Safety risk tolerability

The safety risk probability and severity assessment process can be used to derive a safety risk index. The index created through the methodology described above consists of an alphanumeric designator, indicating the combined results of the probability and severity assessments. The respective severity/probability combinations are presented in the safety risk assessment matrix in Figure 4.

The third step in the process is to determine safety risk tolerability. First, it is necessary to obtain the indices in the safety risk assessment matrix. For example, consider a situation where a safety risk probability has been assessed as occasional (B), and safety risk severity has been assessed as major (4). The composite of probability and severity (4B) is the safety risk index of the consequence.

Likelihood	*Severity*				
	1.Negligible	*2.Minor*	*3.Moderate*	*4.Major*	*5.Catastrophic*
A. Certain/frequent	**Moderate (1A)**	**Moderate (2A)**	**High (3A)**	**Extreme (4A)**	**Extreme (5A)**
B. Likely/occasional	**Low (1B)**	**Moderate (2B)**	**Moderate (3B)**	**High (4B)**	**Extreme (5B)**
C. Possible/remote	**Low (1C)**	**Low (2C)**	**Moderate (3C)**	**Moderate (4C)**	**High (5C)**
D. Unlikely/improbable	**Negligible (1D)**	**Low (2D)**	**Low (3D)**	**Moderate (4D)**	**Moderate (5D)**
E. Exceptional	**Negligible (1E)**	**Negligible (2E)**	**Low (3E)**	**Low (4E)**	**Moderate (5E)**

Figure 4.

The index obtained from the safety risk assessment matrix must then be exported to a safety risk tolerability matrix (see Figure 5) that describes the tolerability criteria for the particular organisation. Using the example above, the criterion for safety risk assessed as 4B falls in the "caution with high risk" category. In this case, the safety risk index of the consequence is not acceptable. The organisation must therefore:

(a) take measures to reduce the organisation's exposure to the particular risk, i.e. reduce the likelihood component of the risk index;

(b) take measures to reduce the severity of consequences related to the hazard, i.e. reduce the severity component of the risk index; or

(c) cancel the operation if mitigation is not possible.

Risk Index	*Tolerability*	*Action required (customise as appropriate)*
5A, 5B, 4A	Extreme risk	Stop operation or process immediately. Unacceptable under the existing circumstances. Do not permit any operation until sufficient control measures have been implemented to reduce the risk to an acceptable level. Top management approval required.
5C, 4B, 3A	High risk	Caution. Ensure that risk assessment has been satisfactorily completed and declared preventive controls are in place. Senior management approval of risk assessment before commencement of the operation or process.
1A, 2A, 2B, 3B, 3C, 4C, 4D, 5D, 5E	Moderate risk	Perform or review risk mitigation as necessary. Departmental approval of risk assessment.
1B, 1C, 2C, 2D, 3D, 3E, 4E	Low risk	Risk mitigation or review is optional.
1D, 1E, 2E	Negligible risk	Acceptable as is. No risk mitigation required.

Figure 5.

2.10.5 Safety risk management

Safety risk management encompasses the assessment and mitigation of safety risks. The objective of safety risk management is to assess the risks associated with identified hazards and develop and implement effective and appropriate mitigations. Safety risk management is therefore a key component of the safety management process.

Safety risks are conceptually assessed as acceptable, tolerable or intolerable. Risks assessed as initially falling in the intolerable region are unacceptable under any circumstances. The probability and/or severity of the consequences of the hazards are of such a magnitude, and the damaging potential of the hazard poses such a threat to safety, that immediate mitigation action is required.

Safety risks assessed in the tolerable region are acceptable provided that appropriate mitigation strategies are implemented by the organisation. A safety risk initially

assessed as intolerable may be mitigated and subsequently moved into the tolerable region provided that such risks remain controlled by appropriate mitigation strategies.

Safety risk management process is briefly illustrated in Figure 6 below.

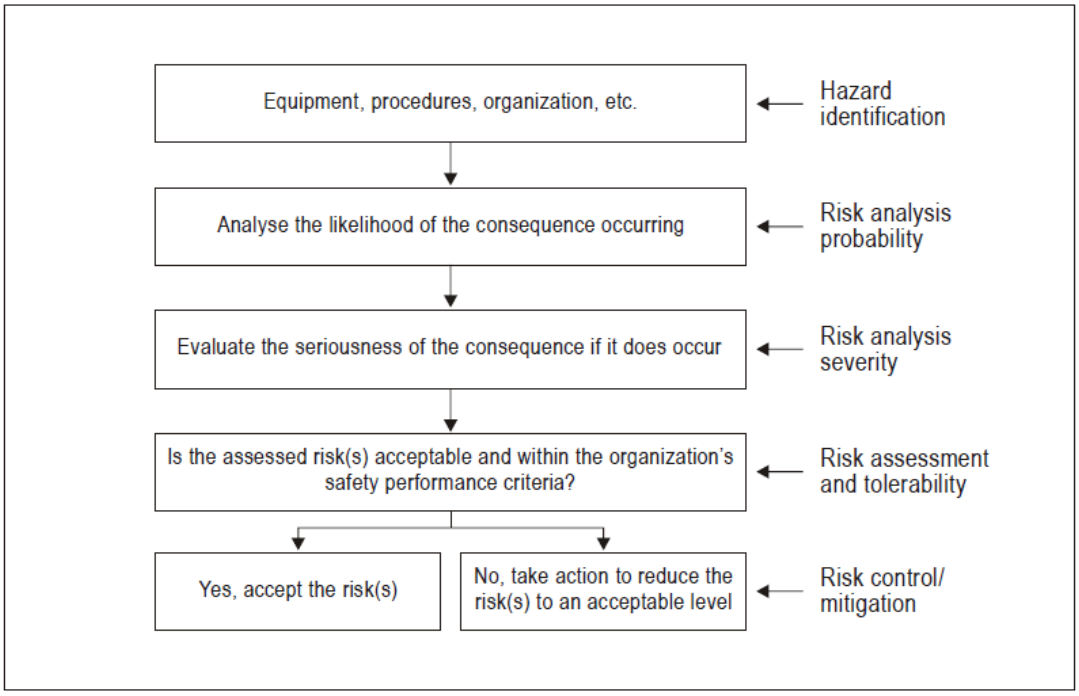

Figure 6.

2.10.6 Risk management documentation

Each risk mitigation exercise will need to be documented as necessary. This may be done on a basic spreadsheet or table for risk mitigation involving non-complex operations, processes or systems. For hazard identification and risk mitigation involving complex processes, systems or operations, it may be necessary to utilise customised risk mitigation software to facilitate the documentation process. Completed risk mitigation documents should be approved by the appropriate level of management.

2.11 Emergency Response Plan (ERP)

An ERP documents actions to be taken by all responsible personnel during aviation-related emergencies. The purpose of an ERP is to ensure that there is an orderly and efficient transition from normal to emergency operations, including assignment of emergency responsibilities and delegation of authority. Authorisation for action by key personnel is also contained in the plan, as well as the means to coordinate efforts necessary to cope with the emergency. The overall objective is to save lives, the safe continuation of operations and the return to normal operations as soon as possible.

CHAPTER 3 SAFETY MANAGEMENT SYSTEM

An SMS is a system to assure the safe operation of aircraft through effective management of safety risk. This system is designed to continuously improve safety by identifying hazards, collecting and analysing data and continuously assessing safety risks. The SMS seeks to proactively contain or mitigate risks before they result in aviation accidents and incidents. It is a system that is commensurate with the organisation's regulatory obligations and safety goals.

SMS is necessary for an aviation organisation to identify hazards and manage safety risks encountered during the delivery of its products or services. An SMS includes key elements that are essential for hazard identification and safety risk management by ensuring that:

(a) the necessary information is available;

(b) the appropriate tools are available for the organisation's use;

(c) the tools are appropriate to the task;

(d) the tools are commensurate with the needs and constraints of the organisation; and

(e) decisions are made based on full consideration of the safety risk.

SMS addresses the aviation activities of an aviation service provider that are related to the safe operation of aircraft. The scope of an SMS may indirectly include other organisational activities that support operational or product development, such as finance, human resources and legal. It is therefore essential to involve all internal and external aviation system stakeholders having a potential impact on the organisation's safety performance. Furthermore, any potential inputs should be taken into consideration at an early stage of SMS implementation and throughout future internal evaluations of the SMS.

CHAPTER 4 SMS FRAMEWORK

This chapter introduces a framework for SMS implementation by relevant aviation service providers. It should be noted that the implementation of the framework should be commensurate with the size of the organisation and the complexity of the products or services provided.

The ICAO SMS framework comprises four components and twelve elements as the minimum requirements for SMS implementation:

1. Safety policy and objectives

    1.1 Management commitment and responsibility
    1.2 Safety accountabilities
    1.3 Appointment of key safety personnel
    1.4 Coordination of emergency response planning
    1.5 SMS documentation

2. Safety risk management

    2.1 Hazard identification
    2.2 Safety risk assessment and mitigation

3. Safety assurance

    3.1 Safety performance monitoring and measurement
    3.2 The management of change
    3.3 Continuous improvement of the SMS

4. Safety promotion

    4.1 Training and education
    4.2 Safety communication

SMS Component 1 Safety policy and objectives

Safety policy outlines the principles, processes and methods of the organisation's SMS to achieve the desired safety outcomes. The policy establishes senior management's commitment to incorporate and continually improve safety in all aspects of its activities. Senior management develops measureable and attainable organisation-wide safety objectives to be achieved.

SMS Element 1.1 Management commitment and responsibility

The service provider shall define its safety policy in accordance with international and national requirements. The safety policy shall:

(a) reflect organisational commitment regarding safety;

(b) include a clear statement about the provision of the necessary resources for the implementation of the safety policy;

(c) include safety reporting procedures;

(d) clearly indicate which types of behaviours are unacceptable related to the service provider's aviation activities and include the circumstances under which disciplinary action would not apply;

(e) be signed by the accountable executive of the organisation;

(f) be communicated, with visible endorsement, throughout the organisation; and

(g) be periodically reviewed to ensure it remains relevant and appropriate to the service provider.

A safety policy statement should meet the intent of the example in Appendix A.

SMS Element 1.2 Safety accountabilities

The service provider shall:

(a) identify the accountable executive who, irrespective of other functions, has ultimate responsibility and accountability, on behalf of the organisation, for the implementation and maintenance of the SMS;

(b) clearly define lines of safety accountability throughout the organisation, including a direct accountability for safety on the part of senior management;

(c) identify 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;

(d) document and communicate safety responsibilities, accountabilities and authorities throughout the organisation; and

(e) define the levels of management with authority to make decisions regarding safety risk tolerability.

SMS Element 1.3 Appointment of key safety personnel

The service provider shall appoint a safety manager who is responsible for the implementation and maintenance of an effective SMS.

SMS Element 1.4 Coordination of emergency response planning

The service provider shall ensure that an emergency response plan (ERP) is properly coordinated with the emergency response plans of those organisations it must interface with during the provision of its services.

SMS Element 1.5 SMS documentation

The service provider shall develop an SMS implementation plan, formally endorsed by the organisation, that defines the organisation's approach to the management of safety in a manner that meets the organisation's safety objectives.

The service provider shall develop and maintain SMS documentation that describes:

(a) the safety policy and objectives;

(b) SMS requirements;

(c) SMS processes and procedures;

(d) accountabilities, responsibilities and authorities for SMS processes and procedures; and

(e) SMS outputs.

The service provider shall develop and maintain an SMS manual as part of its SMS documentation, to be submitted and accepted by CAD.

Guidance for the development of an SMS manual is provided in APPENDIX B.

SMS Component 2 Safety risk management

Service providers should ensure that the safety risks encountered in aviation activities are controlled in order to achieve their safety performance targets. This process is known as safety risk management and includes hazard identification, safety risk assessment and the implementation of appropriate remediation measures.

The safety risk management component systematically identifies hazards that exist within the context of the delivery of its products or services. Hazards may be the result of systems that are deficient in their design, technical function, human interface or interactions with other processes and systems. They may also result from a failure of existing processes or systems to adapt to changes in the service provider's operating environment. Careful analysis of these factors during the planning, design and implementation phases can often identify potential hazards before the system becomes operational.

Understanding the system and its operating environment is also essential for achievement of high safety performance. Hazards may be discovered during the operational life cycle, through employee reports or incident investigations. Analysis of these hazards should be conducted in the context of the system. This context is key to avoiding attribution of events to human error, where defects in the system may be neglected, remaining latent for future and potentially more serious events to occur.

SMS Element 2.1 Hazard identification

The service provider shall develop and maintain a formal process that ensures that hazards associated with its aviation products or services are identified.

Hazard identification shall be based on a combination of reactive, proactive and predictive methods of safety data collection.

SMS Element 2.2 Safety risk assessment and mitigation

The service provider shall develop and maintain a process that ensures analysis, assessment and control of the safety risks associated with identified hazards.

SMS Component 3 Safety assurance

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

The safety assurance process complements that of quality assurance, with each having requirements for analysis, documentation, auditing and management reviews to assure that certain performance criteria are met. While quality assurance typically focuses on the organisation's compliance with regulatory requirements, safety assurance specifically monitors the effectiveness of safety risk controls.

The complementary relationship between safety assurance and quality assurance allows for the integration of certain supporting processes. Such integration can serve to achieve synergies to assure that the service provider's safety, quality and commercial objectives are met.

Finally, safety assurance activities should include the development and implementation of corrective actions in response to findings of systemic deficiencies having a potential safety impact. Organisational responsibility for the development and implementation of corrective actions should reside with the departments cited in the findings.

SMS Element 3.1 Safety performance monitoring and measurement

The service provider shall develop and maintain the means to verify the safety performance of the organisation and to validate the effectiveness of safety risk controls.

The service provider's safety performance shall be verified in reference to the safety performance indicators and safety performance targets of the SMS.

SMS Element 3.2 The management of change

The service provider shall develop and maintain a formal process to identify changes which may affect the level of safety risk associated with its aviation products or services and to identify and manage the safety risks that may arise from those changes.

SMS Element 3.3 Continuous improvement of the SMS

The service provider shall monitor and assess the effectiveness of its SMS processes to enable continuous improvement of the overall performance of the SMS.

SMS Component 4 Safety promotion

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

An organisational safety effort cannot succeed solely by mandate or strict adherence to policies. Safety promotion affects both individual and organisational behaviour and supplements the organisation's policies, procedures and processes, providing a value system that supports safety efforts.

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

SMS Element 4.1 Training and education

The service provider shall develop and maintain a safety training programme that ensures that personnel are trained and competent to perform their SMS duties.

The scope of the safety training programme shall be appropriate to each individual's involvement in the SMS.

SMS Element 4.2 Safety communication

The service provider shall develop and maintain formal means for safety communication that:

(a) ensures personnel are aware of the SMS to a degree commensurate with their positions;

(b) conveys safety-critical information;

(c) explains why particular safety actions are taken; and

(d) explains why safety procedures are introduced or changed.

CHAPTER 5 SMS IMPLEMENTATION

5.1 System description

A system review and description of the SMS elements and their interface with existing systems and processes is the first step in defining the scope and applicability of the SMS. This exercise provides an opportunity to identify any gaps related to the service provider's SMS components and elements. The system description includes the SMS interfaces within the organisation, as well as pertinent interfaces with other external organisations such as subcontractors. An overview of the system description and its accountability and reporting structure should be included in the SMS documentation. For large and complex organisations, details of basic systems and organisational procedures are addressed in the service provider's relevant exposition or administrative manuals. In such cases, a brief outline together with an organisational chart with appropriate cross references may be adequate for the purpose of the system description.

5.2 Integration of management systems

Depending upon the organisational, operational and regulatory contexts, a service provider may implement an integrated SMS. Integration has the potential to provide synergies by managing safety risks across multiple areas of aviation activities. For example, a service provider may implement a single SMS for its design organisation, production organisation, and business aviation flight department. Alternatively, there may be situations where an individual SMS for each type of aviation activity is appropriate. The organisation may define the best means to integrate or segregate its SMS as suits its business or organisational model, subject to CAD's Acceptance that its SMS duties in all service provider roles are being properly discharged. The service provider's SMS may also be integrated with security, occupational health and environmental management systems.

5.2.1 SMS and QMS integration

Aviation service providers typically implement enterprise-wide management systems. Organisational safety performance is dependent on the effective integration of these systems to support the delivery of products and services. In the context of SMS, the most significant aspect of integration is with the service provider's quality management system (QMS). QMS is generally defined as the organisational structure and associated accountabilities, resources, processes and procedures necessary to establish and promote a system of continuous quality assurance and improvement while delivering a product or service.

It should be noted that QMS is also a CAD regulatory requirement for service providers. The QMS programme as well as the quality manager should also be acceptable to CAD.

The QMS and SMS are complementary. QMS is focused on compliance with prescriptive regulations and requirements to meet customer expectations and contractual obligations while the SMS is focused on safety performance. The objectives of an SMS are to identify safety-related hazards, assess the associated risk and implement effective risk controls. In contrast, the QMS focuses on the consistent delivery of products and services that meet relevant specifications.

Given the complementary aspects of SMS and QMS, it is possible to establish a synergistic relationship between both systems that can be summarised as follows:

(a) an SMS is supported by QMS processes such as auditing, inspection, investigation, root cause analysis, process design, statistical analysis and preventive measures;

(b) a QMS may anticipate safety issues that exist despite the organisation's compliance with standards and specifications; and

(c) quality principles, policies and practices are linked to the objectives of safety management.

The relationship between SMS and QMS leads to the complementary contributions of each system to the attainment of the organisation's safety and quality goals. A summary comparison of the two systems is provided in

QMS	*SMS*
Quality	Safety
Quality assurance	Safety assurance
Quality control	Hazard identification and risk control
Quality culture	Safety culture
Compliance with requirements	Acceptable level of safety performance
Prescriptive	Performance-based
Standards and specifications	Organisational and human factors
Reactive > Proactive	Proactive > Predictive

5.3 Gap analysis

A gap analysis compares the service provider's existing safety management processes and procedures with requirements contained in the SMS framework. Aviation service providers will have typically implemented various SMS functions in compliance with CAD regulations or adoption of industry best practices. The development of an SMS should build upon existing organisational structures and control systems. The gap analysis facilitates development of an SMS implementation plan by identifying the gaps that must be addressed to fully implement an SMS. Once the gap analysis has been completed and fully documented, the resources and processes that have been identified as missing or inadequate will form the basis of the SMS implementation plan.

CAD has produced a "SMS GAP ANALYSIS CHECKLIST" in APPENDIX C providing a list of gap analysis questions to facilitate service providers in systematically assessing their existing processes. From an objective response to each gap analysis question, it will be apparent what enhancements or actions are required.

5.4 SMS implementation plan

The organisation's SMS plan, its implementation and periodic review time frames, along with its Safety Performance Indicators (SPIs) as well as their respective Safety Performance Target (SPT) levels and alert levels should be submitted to and developed in consultation with CAD, for the overall regulatory acceptance and oversight facilitation.

Safety (SMS) manager nominated by the organisation whose primary responsibility is to develop and maintain the SMS should be adequately qualified and also subject to CAD's review and acceptance.

For organisations in developing and setting up its SMS initially, CAD has produced a "SMS INITIAL ACCEPTANCE CHECKLIST" for guidance in APPENDIX D

(Ref. ICAO Doc 9859 3rd Edition Chapter 5 Appendix 2)

CHAPTER 6 PHASED APPROACH

The phased approach recognises that implementation of a fully mature SMS is a multi-year process. A phased implementation approach permits the SMS to become more robust as each implementation phase is completed. Fundamental safety management processes are completed before moving to successive phases involving processes of greater complexity.

Four implementation phases are proposed for an SMS. Each phase is associated with various elements (or sub-elements) as per the ICAO SMS framework. It is apparent that the particular configuration of elements in this guidance material is not meant to be absolute. Service providers may choose to make adjustments as may be deemed appropriate for the circumstances.

A summary of the four phases of SMS implementation and their corresponding elements is shown in Figure 7.

Phase 1

The objective of Phase 1 of SMS implementation is to provide a blueprint of how the SMS requirements will be met and integrated into the organisation's control systems, as well as an accountability framework for the implementation of the SMS.

During Phase 1, basic planning and assignment of responsibilities are established. Central to Phase 1 is the gap analysis. From the gap analysis, an organisation can determine the status of its existing safety management processes and can begin planning for the development of further safety management processes. The significant output of Phase 1 is the SMS implementation plan.

Phase 2

The objective of Phase 2 is to implement essential safety management processes, while at the same time correcting potential deficiencies in existing safety management processes. Most organisations will have some basic safety management activities in place at different levels of implementation. This phase aims at consolidating existing activities and developing those which do not yet exist.

Phase 3

The objective of Phase 3 is to establish safety risk management processes. Towards the end of Phase 3, the organisation will be ready to collect safety data and perform safety analyses based on information obtained through the various reporting systems.

Phase 4

Phase 4 is the final phase of SMS implementation. This phase involves the mature implementation of safety risk management and 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.

Four Phases of SMS Implementation *(Reference: ICAO Doc 9859 Table 5-2)*

Phase 1	Phase 2	Phase 3	Phase 4
1. SMS Element 1.1 (i): a) identify the SMS accountable executive; b) establish an SMS implementation team; c) define the scope of the SMS; d) perform an SMS gap analysis. 2. SMS Element 1.5 (i): a) develop an SMS implementation plan. 3. SMS Element 1.3: a) establish a key person/office responsible for the administration and maintenance of the SMS. 4. SMS Element 4.1 (i): a) establish an SMS training programme for personnel, with priority for the SMS implementation team. 5. SMS Element 4.2 (i): a) initiate SMS/safety communication channels	1. SMS Element 1.1 (ii): a) establish the safety policy and objectives, 2. SMS Element 1.2: a) define safety management responsibilities and accountabilities across relevant departments of the organisation; b) establish an SMS / safety coordination mechanism committee; c) establish departmental / divisional SAGs where applicable. 3. SMS Element 1.4: a) establish an emergency response plan. 4. SMS Element 1.5 (ii): a) initiate progressive development of an SMS document / manual and other supporting documentation.	1. SMS Element 2.1 (i): a) establish a voluntary hazard reporting procedure. 2. SMS Element 2.2: a) establish safety risk management procedures. 3. SMS Element 3.1 (i): a) establish occurrence reporting and investigation procedures; b) establish a safety data collection and processing system for high-consequence outcomes; c) develop high-consequence SPIs and associated targets and alert settings. 4. SMS Element 3.2: a) establish a management of change procedure that includes safety risk assessment. 5. SMS Element 3.3 (i): a) establish an internal quality audit programme; b) establish an external quality audit programme.	1. SMS Element 1.1 (iii): a) enhance the existing disciplinary procedure / policy with due consideration of unintentional errors or mistakes from deliberate or gross violations. 2. SMS Element 2.1 (ii): a) integrate hazards identified from occurrence investigation reports with voluntary hazard reporting system; b) integrate hazard identification and risk management procedures with the subcontractor's or customer's SMS where applicable. 3. SMS Element 3.1 (ii): a) enhance the safety data collection and processing system to include lower consequence events; b) develop lower-consequence SPIs and associated targets / alert settings. 4. SMS Element 3.3 (ii): a) establish SMS audit programmes or integrate them into existing internal and external audit programmes; b) establish other operational SMS review / survey programmes where appropriate. 5. SMS Element 4.1 (ii): a) ensure that the SMS training programme for all relevant personnel has been completed. 6. SMS Element 4.2 (ii): a) promote safety information sharing and exchange internally and externally.
SMS Element 1.5: SMS documentation (Phase 1 to 4) >>>>>>>>>>>>>>>>>>>>>>> >>>>>>>>>>>>>>>>>> >>>>>>>>			
SMS Element 4.1 & 4.2: SMS training, education and communication (Phase 1 and thereafter) >>>>>>>>>>> >>>>>>>>			
Note: The SMS element numbers indicated correspond to the ICAO SMS element numbers. Suffixes such as a), b) and c) indicate that the element has been subdivided to facilitate the phased implementation approach.			

CHAPTER 7 CONCLUSION

SMS is a proactive and integrated approach to managing Safety. It should be integrated into the management system of an organisation. It should describe the structure and scope of the organisation, available resources, staff accountabilities, authorities and responsibilities and how decisions are taken and managed throughout the organisation.

Safety management goes beyond the traditional approach of compliance with prescriptive regulations to a systematic approach to managing safety where potential safety risks are identified and managed to a tolerable level as the industry develops and evolves.

SMS can be considered as adopting a business-like approach to safety, similar to the way that finances are managed, with safety plans, safety performance indicators and targets and continuous monitoring of the safety performance of the organisation. It provides for effective risk based decision making processes across the business.

It is important to recognise that SMS is a top down driven system, which means that the Accountable Executive of the organisation is responsible for the implementation and continuing compliance of the SMS as well as the regulatory requirements. Without the full support and ownership of the Accountable Executive the SMS will not be effective.

There is not a 'one size fits all' model for SMS that will cater for all types of organisations. A complex SMS is unlikely to be appropriate for small organisations, and all organisations should tailor their SMS to suit the size, nature and complexity of the operations, and the hazards and associated risks inherent with its activities.

Where an organisation is part of a group that has several approvals a single Group SMS may be developed provided that there is clear accountability between the group and the subsidiary companies.

CHAPTER 8 REFERENCES

REFERENCE MATERIALS:

i. ICAO Annex 19 (Safety Management) 1st Edition 2013

ii. ICAO Safety Management Manual (Doc 9859) 3rd Edition 2013

iii. UKCAA Safety Management Systems – Guidance to Organisations

APPENDIX A SAMPLE SAFETY POLICY STATEMENT

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

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

Our commitment is to:

- support the management of safety through the provision of all appropriate resources that will result in an organisational culture that fosters safe practices, encourages effective safety reporting and communication, and actively manages safety with the same attention to results as the attention to the results of the other management systems of the organisation;

- ensure that the management of safety is a primary responsibility of all managers and employees;

- clearly define, for all staff, managers and employees alike, their accountabilities and responsibilities for the delivery of the organisation's safety performance and the performance of our safety management system;

- establish and operate hazard identification and risk management processes, including a hazard reporting system, in order to eliminate or mitigate the safety risks of the consequences of hazards resulting from our operations or activities, to achieve continuous improvement in our safety performance;

- ensure that no action will be taken against any employee who discloses a safety concern through the hazard reporting system, unless such disclosure indicates, beyond any reasonable doubt, gross negligence or a deliberate or wilful disregard of regulations or procedures;

- comply with and, wherever possible, exceed, legislative and regulatory requirements and standards;

- ensure that sufficient skilled and trained human resources are available to implement safety strategies and processes;

- ensure that all staff are provided with adequate and appropriate aviation safety information and training, are competent in safety matters, and are allocated only tasks commensurate with their skills;

- establish and measure our safety performance against realistic safety performance indicators and safety performance targets;

- continually improve our safety performance through continuous monitoring and measurement, regular review and adjustment of safety objectives and targets, and diligent achievement of these; and

- ensure that externally supplied systems and services to support our operations are delivered meeting our safety performance standards.

(Signed) _____

CEO/Managing Director/or as appropriate

(Ref. ICAO Doc 9859 3rd Edition page 5-5)

APPENDIX B GUIDANCE FOR THE DEVELOPMENT OF AN SMS MANUAL

(Ref. ICAO Doc 9859 3rd Edition from p.5-App 4-1)

This Appendix is designed to help organisations document the processes and procedures required for an SMS. It is intended to provide guidance for the development of an SMS Manual, which can be a separate stand-alone document or it could be incorporated into an existing manual, as required. This suggested format is one way in which an organisation can meet the documentation requirements of SMS.

Use the SMS Manual template to describe the processes for your company SMS. Remember that small operations will have very basic and simple processes compared to a larger company. For example, the reporting system for a company with three employees may well be verbal in many cases. The important thing to remember when developing processes that rely on verbal communication is to keep a record of any hazards discussed and decisions made.

The specimen Manual is formatted in the following manner:

- Section headings with numbering;
- Objective;
- Criteria;
- Cross Reference Documents.

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

Manual Contents

1. Document control;
2. SMS regulatory requirements;
3. Scope and integration of the safety management system;
4. Safety policy;
5. Safety objectives;
6. Safety accountabilities and key personnel;
7. Safety reporting and remedial actions;
8. Hazard identification and risk assessment;
9. Safety performance monitoring and measurement;
10. Safety-related investigations and remedial actions;
11. Safety training and communication;
12. Continuous improvement and SMS audit;
13. SMS records management;
14. Management of change; and
15 Emergency/contingency response plan.

1. Document Control

Objective

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

Criteria

a) Hard copy or controlled electronic media and distribution list.

b) The correlation between the SMS manual and other existing manuals such as the maintenance control manual (MCM) or the operations manual.

c) The process for periodic review of the manual and its related forms/documents to ensure their continuing suitability, adequacy and effectiveness.

d) The manual's administration, approval and regulatory acceptance process.

Cross Reference Documents: Quality manual, engineering manual, etc.

2. SMS Regulatory Requirements

Objective

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

Criteria

(a) Spell out the current SMS regulations/standards. Include the compliance timeframe and advisory material references as applicable.

(b) Where appropriate, elaborate on or explain the significance and implications of the regulations to the organisation.

(c) Establish a correlation with other safety-related requirements or standards where appropriate.

Cross Reference Documents: SMS regulation/requirement references, SMS guidance document references, etc.

3. Scope and Integration of the Safety Management System

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

Criteria

(a) Spell out the nature of the organisation's aviation business and its position or role within the industry as a whole.

(b) Identify the major areas, departments, workshops and facilities of the organisation within which the SMS will apply.

(c) Identify the major processes, operations and equipment which are deemed eligible for the organisation's HIRM programme, especially those which are pertinent to aviation safety. If the scope of the HIRM-eligible processes, operations and equipment is too detailed or extensive, it may be controlled under a supplementary document as appropriate.

(d) Where the SMS is expected to be operated or administered across a group of interlinked organisations or contractors, define and document such integration and associated accountabilities as applicable.

(e) Where there are other related control/management systems within the organisation, such as Quality Management System (QMS), Occupational Safety, Health and

Environment (OSHE) and Security Management System (SeMS), identify their relevant integration (where applicable) within the aviation SMS.

Cross Reference Documents: Quality manual, engineering manual, etc.

4. Safety Policy

Objective

Describe the organisation's intentions, management principles and commitment to improving aviation safety in terms of the product or service provider. A safety policy should be a short description similar to a mission statement.

Criteria

(a) The safety policy should be appropriate to the size and complexity of the organisation.

(b) The safety policy states the organisation's intentions, management principles and commitment to continuous improvement in aviation safety.

(c) The safety policy is approved and signed by the accountable executive.

(d) The safety policy is promoted by the accountable executive and all other managers.

(e) The safety policy is reviewed periodically.

(f) Personnel at all levels are involved in the establishment and maintenance of the safety management system.

(g) The safety policy is communicated to all employees with the intent that they are made aware of their individual safety obligations.

Cross Reference Documents: OSHE safety policy, etc.

5. Safety Objectives

Objective

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

Criteria

(a) The safety objectives have been established.

(b) The safety objectives are expressed as a top-level statement describing the organisation's commitment to achieving safety.

(c) There is a formal process to develop a coherent set of safety objectives.

(d) The safety objectives are publicised and distributed.

(e) Resources have been allocated for achieving the objectives.

(f) The safety objectives are linked to safety indicators to facilitate monitoring and measurement where appropriate.

Cross Reference Documents: Safety performance indicators document, etc.

6. Safety Accountabilities and Key Personnel

Objective

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

Criteria

(a) The accountable executive is responsible for ensuring that the safety management system is properly implemented and is performing to requirements in all areas of the organisation.

(b) An appropriate safety manager (office), safety committee or safety action groups have been appointed as appropriate.

(c) Safety authorities, responsibilities and accountabilities of personnel at all levels of the organisation are defined and documented.

(d) All personnel understand their authorities, responsibilities and accountabilities with regard to all safety management processes, decisions and actions.

(e) An SMS organisational accountabilities diagram is available.

Cross Reference Documents: Company exposition manual, SOP manual, administration manual, etc.

7. Safety Reporting and Remedial Actions

Objective

A reporting system should include both reactive (accident/incident reports, etc.) and proactive/ predictive (hazard reports). Describe the respective reporting systems. Factors to consider include: report format, confidentiality, addressees, investigation/evaluation procedures, corrective/ preventive actions and report dissemination.

Criteria

(a) The organisation has a procedure that provides for the capture of internal occurrences including accidents, incidents and other occurrences relevant to SMS.

(b) A distinction is to be made between mandatory reports (accidents, serious incidents, major defects, etc.), which are required to be notified to the CAA, and other routine occurrence reports, which remain within the organisation.

(c) There is also a voluntary and confidential hazard/occurrence reporting system, incorporating appropriate identity/data protection as applicable.

(d) The respective reporting processes are simple, accessible and commensurate with the size of the organisation.

(e) High-consequence reports and associated recommendations are addressed to and reviewed by the appropriate level of management.

f) Reports are collected in an appropriate database to facilitate the necessary analysis.

8. Hazard Identification and Risk Assessment

Objective

Describe the hazard identification system and how such data are collated. Describe the process for the categorisation of hazards/risks and their subsequent prioritisation for a documented safety assessment. Describe how the safety assessment process is conducted and how preventive action plans are implemented.

Criteria

(a) Identified hazards are evaluated, prioritised and processed for risk assessment as appropriate.

(b) There is a structured process for risk assessment involving the evaluation of severity, likelihood, tolerability and preventive controls.

(c) Hazard identification and risk assessment procedures focus on aviation safety as their fundamental context.

(d) The risk assessment process utilises worksheets, forms or software appropriate to the complexity of the organisation and operations involved.

(e) Completed safety assessments are approved by the appropriate level of management.

(f) There is a process for evaluating the effectiveness of the corrective, preventive and recovery measures that have been developed.

(g) There is a process for periodic review of completed safety assessments and documenting their outcomes.

9. Safety Performance Monitoring and Measurement

Objective

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

Criteria

(a) The formal process to develop and maintain a set of safety performance indicators and their associated performance targets.

(b) Correlation established between the SPIs and the organisation's safety objectives where applicable and the process of regulatory acceptance of the SPIs where required.

(c) The process of monitoring the performance of these SPIs including remedial action procedure whenever unacceptable or abnormal trends are triggered.

(d) Any other supplementary SMS or safety performance monitoring and measurement criteria or process.

10. Safety-related Investigations and Remedial Actions

Objective

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

Criteria

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

(b) Dissemination of completed investigation reports internally as well as to the CAA as applicable.

(c) A process for ensuring that corrective actions taken or recommended are carried out and for evaluating their outcomes/effectiveness.

(d) Procedure on disciplinary inquiry and actions associated with investigation report outcomes.

(e) Clearly defined conditions under which punitive disciplinary action would be considered (e.g. illegal activity, recklessness, gross negligence or wilful misconduct).

(f) A process to ensure that investigations include identification of active failures as well as contributing factors and hazards.

(g) Investigation procedure and format provides for findings on contributing factors or hazards to be processed for follow-up action by the organisation's hazard identification and risk management system where appropriate.

11. Safety Training and Communication

Objective

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

Criteria

(a) The training syllabus, eligibility and requirements are documented.

(b) There is a validation process that measures the effectiveness of training.

(c) The training includes initial, recurrent and update training, where applicable.

(d) The organisation's SMS training is part of the organisation's overall training programme.

(e) SMS awareness is incorporated into the employment or indoctrination programme.

(f) The safety communication processes/channels within the organisation.

12. Continuous Improvement and SMS Audit

Objective

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

Criteria

(a) The process for regular internal audit/review of the organisation's SMS to ensure its continuing suitability, adequacy and effectiveness.

(b) Describe any other programmes contributing to continuous improvement of the organisation's SMS and safety performance, e.g. MEDA, safety surveys, ISO systems.

13 SMS Records Management

Objective

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

Criteria

(a) The organisation has an SMS records or archiving system that ensures the retention of all records generated in conjunction with the implementation and operation of the SMS.

(b) Records to be kept include hazard reports, risk assessment reports, safety action group/safety meeting notes, safety performance indicator charts, SMS audit reports and SMS training records.

(c) Records should be traceable for all elements of the SMS and be accessible for routine administration of the SMS as well as internal and external audits purposes.

14. Management of Change

Objective

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

Criteria

(a) Procedures to ensure that substantial organisational or operational changes take into consideration any impact which they may have on existing safety risks.

(b) Procedures to ensure that appropriate safety assessment is performed prior to introduction of new equipment or processes which have safety risk implications.

(c) Procedures for review of existing safety assessments whenever there are changes to the associated process or equipment.

Cross Reference Documents: Company SOP relating to management of change, etc.

15. Emergency/Contingency Response Plan

Objective

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

Criteria (as applicable to the organisation)

(a) The organisation has an emergency plan that outlines the roles and responsibilities in the event of a major incident, crisis or accident.

(b) There is a notification process that includes an emergency call list and an internal mobilisation process.

(c) The organisation has arrangements with other agencies for aid and the provision of emergency services as applicable.

(d) The organisation has procedures for emergency mode operations where applicable.

(e) There is a procedure for overseeing the welfare of all affected individuals and for notifying next of kin.

(f) The organisation has established procedures for handling the media and insurance-related issues.

(g) There are defined accident investigation responsibilities within the organisation.

(h) The requirement for preservation of evidence, securing the affected area, and mandatory/ governmental reporting is clearly stated.

(i) There is emergency preparedness and response training for affected personnel.

(j) A disabled aircraft or equipment evacuation plan has been developed by the organisation in consultation with aircraft/equipment owners, aerodrome operators or other agencies as applicable.

(k) A procedure exists for recording activities during an emergency response.

Cross Reference Documents: ERP manual, etc.

APPENDIX C SMS GAP ANALYSIS CHECKLIST

SMS GAP ANALYSIS CHECKLIST

Aspects to be analysed or question to be answered	*Answer*	*Evidence / Remarks*
Component 1 – SAFETY POLICIES AND OBJECTIVES		
Element 1.1 – Management commitment and responsibility		
Is there a safety policy in place?	☐ Yes ☐ No ☐ Partial	
Does the safety policy reflect senior management's commitment regarding safety management?	☐ Yes ☐ No ☐ Partial	
Is the safety policy appropriate to the size, nature and complexity of the Organisation?	☐ Yes ☐ No ☐ Partial	
Is the safety policy relevant to aviation safety?	☐ Yes ☐ No ☐ Partial	
Is the safety policy signed by the accountable executive?	☐ Yes ☐ No ☐ Partial	
Is the safety policy communicated, with visible endorsement, throughout the Organisation?	☐ Yes ☐ No ☐ Partial	
Is the safety policy periodically reviewed to ensure it remains relevant and appropriate to the Organisation?	☐ Yes ☐ No ☐ Partial	

Element 1.2 – Safety accountabilities		
Has Organisation identified an accountable executive who, irrespective of other functions, shall have ultimate responsibility and accountability, on behalf of the Organisation, for the implementation and maintenance of the SMS?	☐ Yes ☐ No ☐ Partial	
Does the accountable executive have full control of the financial and human resources required for the operations authorised to be conducted under the operations certificate?	☐ Yes ☐ No ☐ Partial	
Does the Accountable Executive have final authority over all aviation activities of his/her Organisation?	☐ Yes ☐ No ☐ Partial	

Has Organisation identified and documented the safety accountabilities of management as well as operational personnel, with respect to the SMS?	☐ Yes ☐ No ☐ Partial	
Is there a safety committee or review board for the purpose of reviewing SMS and safety performance?	☐ Yes ☐ No ☐ Partial	
Is the safety committee chaired by the accountable executive or by an appropriately assigned deputy, duly substantiated in the SMS manual?	☐ Yes ☐ No ☐ Partial	
Does the safety committee include relevant operational or departmental heads as applicable?	☐ Yes ☐ No ☐ Partial	
Are there safety action groups that work in conjunction with the safety committee?	☐ Yes ☐ No ☐ Partial	

Element 1.3 – Appointment of key safety personnel		
Has the Organisation appointed a qualified person to manage and oversee the day-to-day operation of the SMS?	☐ Yes ☐ No ☐ Partial	
Does the qualified person have direct access or reporting to the accountable executive concerning the implementation and operation of the SMS?	☐ Yes ☐ No ☐ Partial	
Does the manager responsible for administering the SMS hold other responsibilities that may conflict or impair his/her role as SMS manager?	☐ Yes ☐ No ☐ Partial	
Is the SMS manager's position a senior management position not lower than or subservient to other operational or production positions	☐ Yes ☐ No ☐ Partial	

Element 1.4 – Coordination of emergency response planning		
Does the Organisation have an emergency response/contingency plan appropriate to the size, nature and complexity of the Organisation?	☐ Yes ☐ No ☐ Partial	
Does the emergency/contingency plan address all possible or likely emergency/crisis scenarios relating to the Organisation's aviation product or service deliveries?	☐ Yes ☐ No ☐ Partial	
Does the Emergency Response Plan (ERP) include procedures for the continuing safe production, delivery or support of its aviation products or services during such emergencies or contingencies?	☐ Yes ☐ No ☐ Partial	

Is there a plan and record for drills or exercises with respect to the ERP?	☐ Yes ☐ No ☐ Partial	
Does the ERP address the necessary coordination of its emergency response/contingency procedures with the emergency/response contingency procedures of other Organisations where applicable?	☐ Yes ☐ No ☐ Partial	
Does the Organisation have a process to distribute and communicate the ERP to all relevant personnel, including relevant external Organisations?	☐ Yes ☐ No ☐ Partial	
Is there a procedure for periodic review of the ERP to ensure its continuing relevance and effectiveness?	☐ Yes ☐ No ☐ Partial	

Element 1.5 – SMS documentation		
Is there a top-level SMS summary or exposition document which is approved by the accountable manager and accepted by the CAD?	☐ Yes ☐ No ☐ Partial	
Does the SMS documentation address the Organisation's SMS and its associated components and elements?	☐ Yes ☐ No ☐ Partial	
Is the Organisation SMS framework in alignment with CAD/the regulatory SMS framework?	☐ Yes ☐ No ☐ Partial	
Does the Organisation maintain a record of relevant supporting documentation pertinent to the implementation and operation of the SMS?	☐ Yes ☐ No ☐ Partial	
Does the Organisation have an SMS implementation plan to establish its SMS implementation process, including specific tasks and their relevant implementation milestones?	☐ Yes ☐ No ☐ Partial	
Does the SMS implementation plan address the coordination between the service provider's SMS and the SMS of external Organisations where applicable?	☐ Yes ☐ No ☐ Partial	
Is the SMS implementation plan endorsed by the accountable executive?	☐ Yes ☐ No ☐ Partial	

Component 2 –SAFETY RISK MANAGEMENT		
Element 2.1 – Hazard identification		
Is there a process for voluntary hazards/threats reporting by all employees?	☐ Yes ☐ No ☐ Partial	
Is the voluntary hazard/threats reporting simple, available to all personnel involved in safety-related duties and commensurate with the size of the service provider?	☐ Yes ☐ No ☐ Partial	
Does the Organisation safety date collection and processing system include procedures for incident/accident reporting by operational or production personnel?	☐ Yes ☐ No ☐ Partial	
Is incident/accident reporting simple, accessible to all personnel involved in safety-related duties and commensurate with the size of the service provider?	☐ Yes ☐ No ☐ Partial	
Does the Organisation have procedures for investigation of all reported incidents/accidents?	☐ Yes ☐ No ☐ Partial	
Are there procedures to ensure that hazards/threats identified or uncovered during incident/accident investigation processes are appropriately accounted for and integrated into the Organisation's hazard collection and risk mitigation procedure?	☐ Yes ☐ No ☐ Partial	
Are there procedures to review hazards/threats from relevant industry reports for follow-up actions or risk evaluation where applicable?	☐ Yes ☐ No ☐ Partial	

Element 2.2 – Safety risk assessment and mitigation		
Is there a documented hazard identification and risk mitigation (HIRM) procedure involving the use of objective risk analysis tools?	☐ Yes ☐ No ☐ Partial	
Is the risk assessment reports approved by departmental managers or at a higher level where appropriate?	☐ Yes ☐ No ☐ Partial	
Is there a procedure for periodic review of existing risk mitigation records?	☐ Yes ☐ No ☐ Partial	
Is there a procedure to account for mitigation actions whenever unacceptable risk levels are identified?	☐ Yes ☐ No ☐ Partial	
Is there a procedure to prioritise identified hazards for risk mitigation actions?	☐ Yes ☐ No ☐ Partial	

Is there a programme for systematic and progressive review of all aviation safety-related operations, processes, facilities and equipment subject to the HIRM process as identified by the Organisation?	☐ Yes ☐ No ☐ Partial	

Component 3 –SAFETY ASSURANCE		
Element 3.1 – Safety performance monitoring and measurement		
Are there identified safety performance indicators for measuring and monitoring the safety performance of the Organisation's aviation activities?	☐ Yes ☐ No ☐ Partial	
Are the safety performance indicators relevant to the Organisation's safety policy as well as management's high-level safety objectives / goals?	☐ Yes ☐ No ☐ Partial	
Do the safety performance indicators include alert/target settings to define unacceptable performance regions and planned improvement goals?	☐ Yes ☐ No ☐ Partial	
Is the setting of alert levels or out-of-control criteria based on objective safety metrics principles?	☐ Yes ☐ No ☐ Partial	
Do the safety performance indicators include quantitative monitoring of high-consequence safety outcomes (e.g. accident and serious incident rates) as well as lower-consequence events (e.g. rate of non-compliance, deviations)?	☐ Yes ☐ No ☐ Partial	
Are safety performance indicators and their associated performance settings developed in consultation with, and subject to, CAD's agreement?	☐ Yes ☐ No ☐ Partial	
Is there a procedure for corrective or follow-up action to be taken when targets are not achieved and alert levels are exceeded/ breached?	☐ Yes ☐ No ☐ Partial	
Are the safety performance indicators periodically reviewed?	☐ Yes ☐ No ☐ Partial	

Element 3.2 – The management of change		
Is there a procedure for review of relevant existing aviation safety-related facilities and equipment (including HIRM records) whenever there are pertinent changes to those facilities or equipment?	☐ Yes ☐ No ☐ Partial	
Is there a procedure for review of relevant existing aviation safety-related operations and processes (including any HIRM records) whenever there are pertinent changes to those operations or processes?	☐ Yes ☐ No ☐ Partial	
Is there a procedure for review of new aviation safety-related operations and processes for hazards/risks before they are commissioned?	☐ Yes ☐ No ☐ Partial	
Is there a procedure for review of relevant existing facilities, equipment, operations or processes (including HIRM records) whenever there are pertinent changes external to the Organisation such as regulatory/industry standards, best practices or technology?	☐ Yes ☐ No ☐ Partial	

Element 3.3 – Continuous improvement of the SMS		
Is there a procedure for periodic internal audit/assessment of the SMS?	☐ Yes ☐ No ☐ Partial	
Is there a current internal SMS audit/assessment plan?	☐ Yes ☐ No ☐ Partial	
Does the SMS audit plan include the sampling of completed/existing safety risk assessments?	☐ Yes ☐ No ☐ Partial	
Does the SMS audit plan include the sampling of safety performance indicators for data currency and their target/alert settings performance?	☐ Yes ☐ No ☐ Partial	
Does the SMS audit plan cover the SMS interface with subcontractors or customers where applicable?	☐ Yes ☐ No ☐ Partial	
Is there a process for SMS audit/assessment reports to be submitted or highlighted for the accountable manager's attention where appropriate?	☐ Yes ☐ No ☐ Partial	

Component 4 – SAFETY PROMOTION		
Element 4.1 – Training and education		
Is there a programme to provide SMS training/familiarisation to personnel involved in the implementation or operation of the SMS?	☐ Yes ☐ No ☐ Partial	
Has the accountable executive undergone appropriate SMS familiarisation, briefing or training?	☐ Yes ☐ No ☐ Partial	
Are personnel involved in conducting risk mitigation provided with appropriate risk management training or familiarisation?	☐ Yes ☐ No ☐ Partial	
Is there evidence of Organisation-wide SMS education or awareness efforts?	☐ Yes ☐ No ☐ Partial	

Element 4.2 – Safety communication		
Are the Organisation SMS manual and related guidance material accessible or disseminated to all relevant personnel?	☐ Yes ☐ No ☐ Partial	
Is there evidence of a safety (SMS) publication, circular or channel for communicating safety (SMS) matters to employees?	☐ Yes ☐ No ☐ Partial	
Does the Organisation participate in sharing safety information with relevant external industry product and service providers or Organisations, including the relevant aviation regulatory Organisations?	☐ Yes ☐ No ☐ Partial	

APPENDIX D SMS INITIAL ACCEPTANCE CHECKLIST

SMS INITIAL ACCEPTANCE CHECKLIST

Aspects to be analysed or question to be answered	*Answer*	*Evidence / Remarks*
Component 1 – SAFETY POLICIES AND OBJECTIVES		
Element 1.1 – Management commitment and responsibility		
There is a documented safety policy statement.	☐ Yes ☐ No ☐ Partial	
The safety policy is relevant to aviation safety.	☐ Yes ☐ No ☐ Partial	
The safety policy is relevant to the scope and complexity of the Organisation's operations.	☐ Yes ☐ No ☐ Partial	
There is evidence that the safety policy is communicated to all employees with the intent that they are made aware of their individual safety obligations.	☐ Yes ☐ No ☐ Partial	
The safety policy is endorsed by the accountable manager.	☐ Yes ☐ No ☐ Partial	
The safety policy addresses the provision of the necessary human and financial resources for its implementation.	☐ Yes ☐ No ☐ Partial	
There is a periodic review of the safety policy by senior management or the safety committee.	☐ Yes ☐ No ☐ Partial	
The accountable manager's terms of reference indicate his overall responsibility for all safety issues.	☐ Yes ☐ No ☐ Partial	

Element 1.2 – Safety accountabilities		
There is a documented safety (SMS) accountability within the Organisation that begins with the accountable manager.	☐ Yes ☐ No ☐ Partial	
The accountable executive has final authority over all the aviation activities of his/her Organisation.	☐ Yes ☐ No ☐ Partial	
There is a safety committee (or equivalent mechanism) that reviews the SMS and its safety performance.	☐ Yes ☐ No ☐ Partial	

The safety committee includes relevant operational or departmental heads as applicable.	☐ Yes ☐ No ☐ Partial	
The accountable manager's terms of reference indicates his/her ultimate responsibility for his/her Organisation's safety management.	☐ Yes ☐ No ☐ Partial	
The accountable manager's final authority over all operations conducted under his/her Organisation's certificate(s) is indicated in his/her terms of reference.	☐ Yes ☐ No ☐ Partial	
There are departmental or section safety action groups that work in conjunction with the safety committee.	☐ Yes ☐ No ☐ Partial	
There is an appointed safety (SMS) coordinator within the safety action group.	☐ Yes ☐ No ☐ Partial	
The safety committee is chaired by the accountable manager or by an appropriately assigned deputy, duly substantiated in the SMS manual.	☐ Yes ☐ No ☐ Partial	
The safety action groups are chaired by the departmental or section head where applicable.	☐ Yes ☐ No ☐ Partial	

Element 1.3 – Appointment of key safety personnel		
There is a manager who performs the role of administering the SMS.	☐ Yes ☐ No ☐ Partial	
The manager performing the SMS role has relevant SMS functions included in his terms of reference.	☐ Yes ☐ No ☐ Partial	
The manager responsible for administering the SMS does not hold other responsibilities that may conflict or impair his/her role as SMS manager.	☐ Yes ☐ No ☐ Partial	
The SMS manager has direct access or reporting to the accountable manager concerning the implementation and operation of the SMS.	☐ Yes ☐ No ☐ Partial	
The SMS manager is a senior management position not lower than or subservient to other operational or production positions.	☐ Yes ☐ No ☐ Partial	

Element 1.4 – Coordination of emergency response planning		
There is a documented Emergency Response Plan (ERP) or equivalent operational contingency procedure.	☐ Yes ☐ No ☐ Partial	
The ERP is appropriate to the size, nature and complexity of the Organisation.	☐ Yes ☐ No ☐ Partial	
The ERP addresses possible or likely emergency/crisis scenarios relating to the Organisation's aviation product or service deliveries.	☐ Yes ☐ No ☐ Partial	
The ERP includes procedures for the continuing safe production, delivery or support of aviation products or services during such emergencies or contingencies.	☐ Yes ☐ No ☐ Partial	
There is a plan for drills or exercises with respect to the ERP.	☐ Yes ☐ No ☐ Partial	
ERP drills or exercises are carried out according to plan and the result of drills carried out are documented.	☐ Yes ☐ No ☐ Partial	
The ERP addresses relevant integration with external customer or subcontractor Organisations where applicable.	☐ Yes ☐ No ☐ Partial	
There is a procedure for periodic review of the ERP to ensure its continuing relevance and effectiveness.	☐ Yes ☐ No ☐ Partial	

Element 1.5 – SMS documentation		
There is an SMS document or exposition which is approved by the accountable manager and accepted by the CAD.	☐ Yes ☐ No ☐ Partial	
The SMS document provides an overview or exposition of the Organisation's SMS framework and elements.	☐ Yes ☐ No ☐ Partial	
The SMS document is a stand-alone controlled document or a distinct part/section of an existing CAD endorsed/accepted document.	☐ Yes ☐ No ☐ Partial	
All components and elements of SMS regulatory requirements are addressed in the SMS document.	☐ Yes ☐ No ☐ Partial	
Records are maintained pertaining to safety risk assessments performed.	☐ Yes ☐ No ☐ Partial	
Records pertaining to identified or reported hazards/threats are maintained.	☐ Yes ☐ No ☐ Partial	

The SMS document's exposition of each SMS element includes cross-references to supporting or related procedures, manuals or systems as appropriate.	☐ Yes ☐ No ☐ Partial	
Records are maintained pertaining to safety committee/safety action group (SAG) meeting (or equivalent) minutes.	☐ Yes ☐ No ☐ Partial	
Records pertaining to periodic review of existing safety/risk assessments or special review in conjunction with relevant changes are available.	☐ Yes ☐ No ☐ Partial	
The SMS procedures reflect appropriate integration with other relevant management systems within the Organisation, such as quality management system (QMS), occupational safety, health and environment (OSHE), security, as applicable.	☐ Yes ☐ No ☐ Partial	
The SMS procedures reflect relevant coordination or integration with external customer or subcontractor Organisations where applicable.	☐ Yes ☐ No ☐ Partial	
There is a process to periodically review the SMS exposition and supporting documentation to ensure their continuing relevance.	☐ Yes ☐ No ☐ Partial	

Component 2 –SAFETY RISK MANAGEMENT		
Element 2.1 – Hazard identification		
There is a procedure for voluntary hazards/threats reporting by all employees.	☐ Yes ☐ No ☐ Partial	
There is a procedure for incident/accident reporting by operational or production personnel.	☐ Yes ☐ No ☐ Partial	
There is a procedure for investigation of incident/accidents relating to quality or safety.	☐ Yes ☐ No ☐ Partial	
In the hazard identification system, there is a clear definition of and distinction between hazards and consequences.	☐ Yes ☐ No ☐ Partial	
The hazard reporting system is confidential and has provisions to protect the reporter's identity.	☐ Yes ☐ No ☐ Partial	
The Organisation's internal investigation and disciplinary procedures distinguish between premeditated and deliberate violations and unintentional errors and mistakes.	☐ Yes ☐ No ☐ Partial	
There is a procedure to identify hazards/threats from internal incident/accident investigation reports for follow-up risk mitigation where appropriate.	☐ Yes ☐ No ☐ Partial	

There is a procedure to review hazards/threats from relevant industry service or incident/accident reports for risk mitigation where applicable.	☐ Yes ☐ No ☐ Partial	
There is a procedure for periodic review of existing risk analysis records.	☐ Yes ☐ No ☐ Partial	

Element 2.2 – Safety risk assessment and mitigation		
There is a documented hazard identification and risk mitigation (HIRM) procedure involving the use of objective risk analysis tools.	☐ Yes ☐ No ☐ Partial	
There is a procedure for identification of operations, processes, facilities and equipment which are deemed (by the Organisation) as relevant for HIRM.	☐ Yes ☐ No ☐ Partial	
There is a programme for progressive hazard identification and risk assessment (HIRA) performance of all aviation safety-related operations, processes, facilities and equipment as identified by the Organisation.	☐ Yes ☐ No ☐ Partial	
Risk assessment reports are approved by departmental managers or at a higher level where appropriate.	☐ Yes ☐ No ☐ Partial	
Recommended mitigation actions which require senior management decision or approval are accounted for and documented.	☐ Yes ☐ No ☐ Partial	
There is a procedure to prioritise HIRA performance for operations, processes, facilities and equipment with identified or known safety-critical hazards/risks.	☐ Yes ☐ No ☐ Partial	
There is evidence of progressive compliance and maintenance of the Organisation's HIRA performance programme.	☐ Yes ☐ No ☐ Partial	

Component 3 –SAFETY ASSURANCE		
Element 3.1 – Safety performance monitoring and measurement		
There are identified safety performance indicators for measuring and monitoring the Organisation's safety performance.	☐ Yes ☐ No ☐ Partial	
There are high-consequence data-based safety performance indicators (e.g. accident and serious incident rates).	☐ Yes ☐ No ☐ Partial	
There are lower-consequence safety performance indicators (e.g. non-compliance, deviation events).	☐ Yes ☐ No ☐ Partial	
There are alert and/or target level settings within the safety performance indicators where appropriate.	☐ Yes ☐ No ☐ Partial	
There is a procedure for corrective or follow-up action to be taken when targets are not achieved and/or alert levels are breached.	☐ Yes ☐ No ☐ Partial	
Safety performance indicators are reviewed by the safety committee for trending, alert levels that have been exceeded and target achievement where applicable.	☐ Yes ☐ No ☐ Partial	

Element 3.2 – The management of change		
There is a procedure for review of relevant existing aviation safety-related facilities and equipment (including HIRA records) whenever there are pertinent changes to those facilities or equipment.	☐ Yes ☐ No ☐ Partial	
There is a procedure for review of relevant existing aviation operations and processes (including HIRA records) whenever there are pertinent changes to those operations or processes.	☐ Yes ☐ No ☐ Partial	
There is a procedure for review of new aviation safety-related facilities and equipment for hazards/risks before they are commissioned.	☐ Yes ☐ No ☐ Partial	
There is a procedure for review of new aviation safety-related operations and processes for hazards/risks before they are commissioned.	☐ Yes ☐ No ☐ Partial	
There is a procedure for review of relevant existing facilities, equipment, operations or processes (including HIRM records) whenever there are pertinent changes external to the Organisation such as regulatory/industry standards, best practices or technology.	☐ Yes ☐ No ☐ Partial	

Element 3.3 – Continuous improvement of the SMS		
There is a procedure for periodic internal audit/assessment of the SMS.	☐ Yes ☐ No ☐ Partial	
There is a current internal SMS audit/assessment plan.	☐ Yes ☐ No ☐ Partial	
There is a documented internal SMS audit/assessment procedure.	☐ Yes ☐ No ☐ Partial	
There is a follow-up procedure to address audit corrective actions.	☐ Yes ☐ No ☐ Partial	
The SMS audit plan includes the sampling of completed safety assessments.	☐ Yes ☐ No ☐ Partial	
SMS audit/assessment has been carried out according to plan.	☐ Yes ☐ No ☐ Partial	
There is a process for SMS audit/assessment reports to be submitted or highlighted for the accountable manager's attention when necessary.	☐ Yes ☐ No ☐ Partial	
The SMS audit plan covers the SMS roles/inputs of contractors where applicable.	☐ Yes ☐ No ☐ Partial	

Component 4 – SAFETY PROMOTION		
Element 4.1 – Training and education		
There is a documented SMS training/familiarisation policy for personnel.	☐ Yes ☐ No ☐ Partial	
The manager responsible for SMS administration has undergone an appropriate SMS training course.	☐ Yes ☐ No ☐ Partial	
The accountable manager has undergone appropriate SMS familiarisation, briefing or training.	☐ Yes ☐ No ☐ Partial	
Personnel involved in conducting risk evaluation are provided with appropriate risk management training or familiarisation.	☐ Yes ☐ No ☐ Partial	
Personnel directly involved in the SMS (safety committee/SAG members) have undergone appropriate SMS training or familiarisation.	☐ Yes ☐ No ☐ Partial	
There is evidence of Organisation-wide SMS education or awareness efforts.	☐ Yes ☐ No ☐ Partial	

Element 4.2 – Safety communication		
Are the Organisation SMS manual and related guidance material accessible or disseminated to all relevant personnel?	☐ Yes ☐ No ☐ Partial	
There is evidence of a safety (SMS) publication, circular or channel for communicating safety and SMS matters to employees.	☐ Yes ☐ No ☐ Partial	
Does the Organisation participate in sharing safety information with relevant external industry product and service providers or Organisations, including the relevant aviation regulatory Organisations?	☐ Yes ☐ No ☐ Partial	