Advisory Circular

NCAA-AC: SMS 001
February, 2019

Nigerian Civil Aviation Authority
(NCAA)

IMPLEMENTATION OF SAFETY MANAGEMENT SYSTEMS (SMS)

1.0 PURPOSE

This document has been developed to give sufficient understanding of SMS concepts and the development of management policies and processes to implement and maintain an effective SMS with the purpose of providing guidance on the implementation of SMS.

2.0 REFERENCES

Part 20 of the Nigerian Civil Aviation Regulations (Nig. CARs); Safety Management

International Civil Aviation Organisation (ICAO) Annex 19; Safety Management

Nig. CARs Part 3 (Approved Training Organisation), Part 6 (Approved Maintenance Organisation), Part 9 (Air Operator Certification and Administration), Part 12 (Aerodrome Regulations) and Part 14 (Air Navigation Services)

INTRODUCTION:

This Advisory Circular (AC) should be read in conjunction with the Nigeria Civil Aviation Regulations (Nig. CARs) Part 20 on Safety Management, ICAO Annex 19 and the ICAO Document 9859.

The Nig. CARs Part 20 and the ICAO Annex 19 require service providers to implement a Safety Management System (SMS) to assess the safety implications and safety hazards involved in their operations, and to determine the action necessary to reduce the risks of those hazards to acceptable levels.

This Advisory Circular is intended to provide advice and guidance to service providers and illustrates one of the many acceptable means of complying with the Nig. CARs Part 20 and to explain certain regulatory requirements by providing informative, interpretative and explanatory material.

This document applies to all entities described in the Nig. CARs Part 20 as service providers to include; Air Operator's Certificate (AOC) holders, Approved Maintenance Organisations (AMOs), Air Navigation Service Providers (ANSPs), Aerodromes and Approved Training Organisations (ATOs) that are exposed to safety risks during the provision of their services. It also applies to International General Aviation operators of large or turbojet aeroplanes.

The NCAA will certify and continuously oversight Service Providers' SMS by assessing for compliance with the Nig. CARs and determining its effectiveness with the aid of appropriate SMS evaluation tool. This tool is available to the public in the interest of transparency.

A Safety Management System is described as a systematic and proactive approach for managing safety risks that are associated with the consequences of hazard present in a system. As with other management systems, it includes goal setting, planning, and measuring performance. An effective safety management system must be systematic; i.e. woven into the fabric of an organisation without compartmentalisation, proactive; be forward looking; i.e. preventing latent conditions from precipitating into incidents and accidents and finally explicit; i.e. documented to ensure availability of approved information and consistency and standardisation of its implementation. Such effective SMS will become part of the organisational culture and will be evident in the way the people do their jobs.

Safety management goes beyond compliance with prescriptive regulations but includes performance-based systems, where service providers are required to justify their operations by continuously collecting, collating and analysing safety data to systematically identify and

manage potential safety risks to acceptable levels. Service Providers' SMS must adopt a business-like approach to safety by giving it equivalent relevance like such given to financial management and other organisational management systems through the establishment and implementation of effective safety plans, realistic safety performance indicators and targets and continuous monitoring of the safety performance of the organisation to ensure conformance with the organisational safety policies and objectives. This will enable effective risk-based decision making processes across the system.

It is important to recognise that SMS is a top down driven system, which means that the accountable manager is responsible for the establishment, implementation and continuing compliance of the SMS by the organisation. The accountable manager must wholeheartedly buy into the SMS, with strong commitment, support and ownership without which the SMS will not be effective. However, safety is a shared responsibility across the whole organisation and requires the involvement of all staff.

SMS establishment and implementation will depend on the size and complexity of an organisation's aviation activities. Therefore, a 'one size fits all' model for SMS that will cater for all types of organisations does not exist. Organisations should therefore, customise their SMS to conform to the size, nature and complexity of their respective operation, and the hazards and associated safety risks inherent with their activities.

Chapter 1

Safety Management System (SMS):

ICAO Document 9859 describes SMS as a proactive and integrated approach to managing safety including the necessary organisational structures, accountabilities, policies and procedures. SMS should go beyond being an approved manual containing safety objectives, policies and procedures but must include their effective implementation to ensure the establishment of equivalence between the approved documentations and organisational practices. Such faithful implementation to the intent of the documentations will result to a safety management integrated into the day to day activities of the organisation and the development of an organisational culture that reflects the safety policy and objectives.

At the core of the SMS is a formal risk management process that identifies hazards and assesses and manages safety risks through elimination or their mitigation. It is important to recognise that even with mitigations in place, some residual risk will remain and an effective SMS will enable organisations to determine their acceptability and manage them as appropriate.

Safety risks generated by both internal and external aviation system stakeholders of an organisationincluding contracted activities and other third parties can have a potential impact on its safety performance and therefore must be considered. Therefore, when there is in existence a formal agreement with other organisations for the provision of services, processes and procedures for the reporting of safety related matters and the management of associated safety risks should be included.

1.1: Safety Management System Gap Analysis and Implementation Plan:

Many aviation service providers will have already implemented various elements of the components of SMS while complying with industry requirements or adopting industry best practices. Therefore, conducting a gap analysis to compare their existing safety management processes and procedures with the requirements contained in the Nig. CARs Part 20 SMS framework should be the first step.

The development of an SMS should build upon existing organizational structures and control systems. The gap analysis should facilitate the development of an SMS implementation plan by identifying the gaps that must be addressed to fully implement an SMS as required by Nig. CARs Part 20. Once the gap analysis has been completed and fully documented, the resources and processes(what, when and by whom) that have been identified as missing or inadequate will form the basis of the SMS implementation plan.

The plan must be endorsed by the accountable manager and should be developed to allow prioritising of the different elements over a period of time. The SMS implementation plan should include realistic timelines and milestones that are consistent with the requirements identified in the gap analysis process, the size of the service provider and the complexity of its products or services. It must also address coordination with external organizations or contractors where applicable and be reviewed regularly and updated as necessary. Building an SMS overnight will be far too challenging and a step by step approach (phase implementation) will deliver a more effective SMS in the end.

The NCAA Form: SP-SMS001 (Service Providers SMS Gap Analysis and Implementation Plan) is available on the NCAA Website and forms the basis of the Service Provider's initial assessment of the existence of the elements and components of SMS Framework in its organisation.

Chapter 2

The Nigerian Civil Aviation Regulation's (Nig. CARs) Service Provider's SMS framework:

The Nig. CARs Service Provider's SMS framework comprises of the following four components;

1) *Safety Policy and Objectives;*
2) *Safety Risk Management;*
3) *Safety Assurance;*
4) *Safety Promotion.*

Whilst these four components of an SMS may appear to be separate, it is important to recognise that they are all interrelated as they represent the two core operational processes underlying an SMS (Components 2&3) as well as the organisational arrangement that are necessary to support the core operational processes (Components 1&4). They can only function effectively if all four are built on a foundation of a positive organisational safety culture, which must be driven from the top of the organisation by the accountable manager and the senior management team.

Each component is sub-divided into elements; which represent the specific sub-processes, tasks or tools that the actual management systems must utilise to conduct the management of safety. Together with the twelve elements, the components are intended as a principled guide for the development and implementation of a Service Provider's SMS.

Chapter 3
SMS Component 1: Safety Policy and Objectives

Safety policies and objectives create the frame of reference for an organisation's SMS. The safety policy outlines the aims and objectives including the principles, processes and methods that the organisation will use to achieve the desired safety outcomes. The policy should establish senior management's commitment to incorporate and continually improve safety in all aspects of its activities and also the development of measureable and attainable organization wide safety objectives to be achieved.

During the development of a safety policy, the senior management may consider it necessary to consult with the key safety personnel, and where appropriate, staff representative bodies to ensure that the safety policy and stated objectives are relevant to all staff. Such coordination will generate a sense of shared responsibility for the safety culture amongst staff in the organisation and lead to a positive safety culture, where all staff are responsible for, and consider the impact of, safety on everything they do.

The safety policy and objectives consists of the following elements:

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.

3.1: SMS Element 1.1: Management Commitment and Responsibility

The service provider should define its safety policy in accordance with Nig. CARs Part 20 and international requirements. The safety policy shall:

a) Reflect organizational 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 manager of the organization;
f) Be communicated with visible endorsement throughout the organization; and
g) Be periodically reviewed to ensure it remains relevant and appropriate to the service provider.

Senior Management should:

a) *Develop and visibly endorse the safety policy, which is signed and actively supported by the accountable manager;*

b) *Continuously communicate, promote and demonstrate the safety policy to all appropriate staff;*

c) *Specify and allocate necessary human and financial resources; and*

d) *Establish safety objectives and performance standards that identify what the organization intends to achieve in terms of safety management. These safety objectives and performance standards must be linked to the Safety Performance Indicators (SPIs), Safety Performance Targets (SPTs) and the SMS mitigation actions, which monitor and measure the safety performance of the organisation and the effectiveness of the SMS.*

The safety policy must include a commitment to:

a) *Achieve the highest safety standards;*
b) *Comply with all applicable legal requirements, meet all applicable standards (both international and local) and consider the adoption of best practices appropriate to the activity;*
c) *Provide all the necessary resources;*
d) *Ensure safety is a primary responsibility of all staff, especially managers; and*
e) *Ensure that the safety policy is understood, implemented and maintained at all levels both internally and externally.*

The safety policy should also actively encourage effective safety reporting by appropriately protecting safety data and the reporters of such data by defining a just culture. The just culture should define the line between acceptable and unacceptable behaviours and provide fair and just protection to all personnel. NCAA Form: SP-SMS 002 is an example of a Safety Policy Statement.

3.2: SMS Element 1.2: Safety Accountabilities

The service provider should:

a) *Identify the accountable manager who, irrespective of other functions, has ultimate responsibility and accountability, on behalf of the organization, for the implementation and maintenance of the SMS;*

b) *Clearly define lines of safety accountability throughout the organization, 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 organization; and*

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

The accountable manager should be a single and identifiable person having ultimate responsibility for the SMS, including responsibility to provide the resources essential to its implementation and maintenance. Depending on the size, structure and complexity of the organization, the accountable manager may be the Chief Executive Officer (CEO) of the service provider organization, the chairperson of the board of directors, a partner or the proprietor.

The appointment of an accountable manager who is given the required authorities and responsibilities requires that the individual has the necessary attributes to fulfill the role. The accountable manager's authorities and responsibilities include, but may not be limited to:

a) *Provision and allocation of human, technical, financial or other resources necessary for the effective and efficient performance of SMS;*
b) *Direct responsibility for the conduct of the organization's affairs;*
c) *Final authority over operations under the certificate/approval of the organization;*
d) *Establishment and promotion of the safety policy;*
e) *Establishment of the organization's safety objectives and safety targets;*
f) *Acting as the organization's safety champion;*
g) *Having final responsibility for the resolution of all safety issues; and*
h) *Establishing and maintaining the organization's competence to learn from the analysis of data collected through its safety reporting system.*

The above stated responsibilities should not be delegated.

The organisation should clearly define in its SMS documentation the lines of safety accountability throughout the organisation, which should include the direct accountability for safety on the part of the accountable manager and senior management. The mandatory safety responsibilities and expected behaviours of key personnel (e.g. nominated post-holders, safety manager, safety officers, safety committee members) should also be defined or embedded into their existing job descriptions, processes and procedures. Safety is everyone's responsibility and all staff should be aware of their safety roles and responsibilities.

3.3: SMS Element 1.3: Appointment of Key Safety Personnel

The service provider should create appropriate safety committees and appoint a safety manager, who will be responsible for the implementation and maintenance of an effective SMS.

3.3.1: The Safety Manager

The safety manager should be responsible for the development, administration, maintenance and promotion of an effective safety management system and is the focal point of the organisation's SMS. The safety manager should report directly to the accountable manager and the position should be given appropriate status in the organisation in order to provide the necessary degree of authority and independence when dealing with safety matters.

The safety manager should carry out the following functions:

- *a) Manage the SMS implementation plan on behalf of the accountable manager;*
- *b) Perform/Facilitate the risk management process that should include hazard identification, safety risk assessment and mitigation;*
- *c) Monitor corrective actions to ensure their accomplishment and evaluating their effectiveness;*
- *d) Provide periodic reports on the organisation's safety performance;*
- *e) Maintain records and safety management documentation;*
- *f) Plan and facilitate safety management training that meets acceptable standards for the staff;*
- *g) Provide independent advice on safety matters;*
- *h) Monitor safety concerns in the aviation industry and their perceived impact on the organization's operations aimed at service delivery;*
- *i) Initiate and participate in occurrence/accident investigations;*
- *j) Coordinate and communicate information to the NCAA and other similar organisations and contracted organisations.*

The selection criteria for a safety manager should include but not limited to the following;

a) *Broad operational, technical knowledge and experience in the functions of the organisation and the supporting systems;*
b) *Analytical and problem-solving skills;*
c) *Effective oral and written communication skills;*
d) *An understanding of human and organisational factors;*
e) *Detailed knowledge of safety management principles and practices; and*
f) *Project management skills.*

It is important to note that accountability for the SMS rests with the accountable manager and not the safety manager. NCAA Form #: SP-SMS 003 details the sample job description for a safety.

3.3.2: Safety Committees

3.3.2.1: Safety Review Committee (or equivalent Safety Board)

The Safety Review Committee (SRC) is a high level committee that deals with high-level issues related to policies, resource allocation and organizational performance monitoring. It is chaired by the accountable manager and considers the organisation's strategic safety functions by providing the platform to achieve the objectives of resource allocation and the assessment of the effectiveness and efficiency of risk mitigation strategies that are used to achieve the established safety performance targets of the organisation. The SRC should normally include the senior managers, line managers responsible for functional areas as well as those from relevant administrative departments of the organisation. Membership of the board and frequency of meetings should be defined.

The SRC should:

a) *Monitor the effectiveness of the SMS;*
b) *Monitor that any necessary corrective action is taken in a timely manner;*
c) *Monitor safety performance against the organization's safety policy and objectives;*
d) *Monitor the effectiveness of the organization's safety management processes which support the declared corporate priority of safety management as another core business process;*
e) *Monitor the effectiveness of the safety supervision of subcontracted operations; and*
f) *Ensure that appropriate resources are allocated to achieve safety performance beyond that required by regulatory compliance.*

3.3.2.2: Safety Action Group

The Safety Action Group (SAG) is a tactical entity that reports to and takes strategic direction from the SRC to deal with specific implementation issues. It is composed of line managers and front-line personnel and is normally chaired by a designated line manager. Membership of the group and frequency of meetings should be defined. The safety manager may also participate in the SAG.

In very large organisations more than one SAG may be established that focus on specific areas, while in small organisations of less than 20 full time employees, a single safety committee may be established combining the functions of the SRC and SAG.

The SAG should:

a) Oversee and review operational effectiveness of the safety risk management processes;

b) Coordinate the resolution of mitigation strategies for identified consequences of hazards;

c) Assess the safety impact related to the introduction of operational changes and new technologies;

d) Oversee and review the implementation of corrective action plans;

e) Oversee that corrective action is achieved within agreed timescales;

f) Review the effectiveness of safety recommendations and safety promotion;

g) Oversee and review the results of safety data analysis.

3.4: SMS Element 1.4: Coordination of Emergency Response Planning

The Service Provider should establish an Emergency Response Plan (ERP) that documents the actions to be taken by the organisation and all responsible individuals during aviation-related emergencies. The ERP should reflect the size, nature and complexity of the activities performed by the organisation and integrated into the organisation's SMS. The ERP should be properly coordinated with the ERPs of those organizations it must interface with during the provision of its services.

A Service Provider's ERP should ensure:

a) An orderly and efficient transition from normal to emergency operations;

b) Assignment of emergency responsibilities and delegation of authority;

c) Authorisation for actions by key personnel contained in the plan;

d) Means to coordinate efforts including those with other organisations necessary to cope with the emergency; and

e) Safe continuation of operations or return to normal operations as soon as practicable.

The ERP should set out the responsibilities, roles and actions for the various agencies and personnel involved in dealing with emergencies. It may include checklists and contact details and the ERP should be regularly reviewed and tested. Key personnel should have easy access to the ERP at all times.

Refer to NCAA Form # SP-SMS 004 for further guidance on ERP.

3.5: SMS Element 1.5: SMS Documentation

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

a) SMS Manual; A top-level description (exposition) document, which describes the organization's SMS according to its components and elements and also facilitates the organization's internal administration, communication and maintenance of the SMS. It should serve as the organization's SMS communication (declaration) to the NCAA for the purpose of regulatory acceptance, assessment and subsequent oversight of the SMS; and

b) SMS records and documentation management; Substantiating the existence and ongoing operation of the SMS (Gap Analysis and Phased Implementation Plan, hazard logs, risk assessments, safety cases, meeting minutes, etc.);

The organisation's SMS Manual should be the key instrument and vehicle for communicating the approach to safety for the whole of the organisation. It should document all aspects of the SMS, including the safety policy, objectives, procedures and individual safety accountabilities. As safety requirements continuously evolve, the SMS Manual should be a living document and should be reviewed regularly to ensure it remains current, accurate and appropriate. The SMS Manual may be a stand-alone document or a distinct "SMS section/chapter" incorporated into an existing document, approved by the Authority.

Contents should include:

a) Scope of the SMS;

b) Safety policy and objectives;

c) Safety accountabilities;

d) Key safety personnel;

e) Documentation control procedures;

f) Hazard identification reporting and risk management schemes;

g) Safety performance monitoring;

h) Incident investigation and reporting

i) Emergency response planning;

j) Management of change processes;

k) Safety promotion;

l) Contracted activities;

m) Just culture policy and supporting processes.

NCAA-AC SMS 002 Advisory Circular provides detailed guidance on the development of a SMS Manual.

Chapter 4
SMS Component 2: Safety Risk Management

Safety Risk Management is aimed at ensuring that safety risks are controlled in order to achieve safety performance targets and includes the following:

a) Hazard identification processes;
b) Safety Risk assessment and the implementation of appropriate remediation measures (mitigation processes);

Safety risk management is one of the core processes of the SMS. It systematically starts with the identification of hazards that exist within the context of the delivery of organisational products or services and then assessing the risks associated with the hazards in terms of severity and likelihood. Once the level of risk is identified, appropriate control measures (remedial action or mitigation measures) can be implemented to reduce the level of risk to an acceptable level. Mitigation measures should then be monitored to ensure that they have had the desired effect. It is important that a common standard and process for risk assessment and control is applied throughout the organisation.

4.1: SMS Element 2.1: Hazard Identification

A hazard is any condition or object that has 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. The service provider should develop and maintain a formal process that ensures that hazards associated with its aviation products or services are identified.

Such hazard identification process will enable the collection, record, analysis, acting on and generation of feedback about hazards that affect the safety of the operational activities of the organisation. In a mature SMS, hazard identification is continuous and is an integral part of the service provider's organisational processes.

Hazard identification is based on a combination of reactive, proactive and predictive safety data collection methodologies and is the first step in the safety risk management process.

- *Reactive methods may include data from accidents, incidents, Mandatory Occurrence Reporting (MOR) etc.*
- *Proactive methods of safety data collection may include Safety Surveys, Audits, Voluntary Reporting Systems etc. and*
- *Predictive methods of safety data collection may include Flight Data Analysis, Direct Observation Systems etc.*

It is also to be understood that judgements of subject matter experts can also contribute to hazard identification through structured approaches like group brainstorming sessions, workshops and safety committee meetings. During initial implementation of SMS, organisations should carry out an initial hazard identification exercise on its current operations to create a baseline safety case or an initial risk register. Hazard identification then becomes an ongoing activity and hazard logs and risk registers should be continuously reviewed and updated as changes are introduced into the organisation. Organisations should look externally for possible hazards from the following areas; accident reports, MOR publications, industry trade associations, outsourced services or the NCAA Safety Plan.

4.1.1: Safety Reporting

Information used to measure the organization's safety performance is generated through its safety reporting systems. There are two types of reporting systems:

a) *Mandatory Incident Reporting Systems; and*
b) *Voluntary Incident Reporting Systems.*

Mandatory incident reporting systems require the reporting of certain types of events (e.g. incidents, runway incursions) to the NCAA. The reporting criteria and scope of reportable occurrences are detailed and identified in the Nig. CARs. Mandatory reporting systems tend to collect information related to high-consequence technical failures than other aspects of operational activities.

Voluntary reporting systems allow for the submission of information related to observed hazards or inadvertent errors without an associated legal or administrative requirement to do so. This system is considered "non-punitive" because it affords protection to reporters thereby ensuring the continued availability of such information to support continuous improvements in safety performance. While the nature and extent of service providers' non-punitive policies may vary, the intent is to promote an effective reporting culture and proactive identification of potential safety deficiencies.

Voluntary reporting systems may be confidential, requiring that any identifying information about the reporter is known only to "gatekeepers" in order to allow for follow-up action. Confidential incident reporting systems facilitate the proactive disclosure of errors, near misses and hazards leading to human error, without fear of retribution or embarrassment.

To be effective, service providers should ensure that safety reporting tools are readily accessible to operational personnel. Operational personnel should be educated on the benefits of safety reporting systems and provided with positive and effective feedback

regarding remedial actions taken in response to the report and be assured on the confidentiality of their identity and report.

NCAA Form #: SP-SMS 007 provides guidance on a service provider's voluntary and confidential reporting systems.

4.2: SMS Element 2.2: Risk Assessment and Mitigation

The service provider should develop and maintain a process that ensures analysis, assessment and control of the safety risks associated with identified hazards. This process should start with the identification of hazards and their potential consequences.

Following the identification of a hazard, a safety risk assessment is carried out in terms of severity and probability to define the level of risk (safety risk index):

- *Severity: How bad will it be if the unwanted safety event occurs?*
- *Probability: How likely is the unwanted safety event to occur or reoccur?*

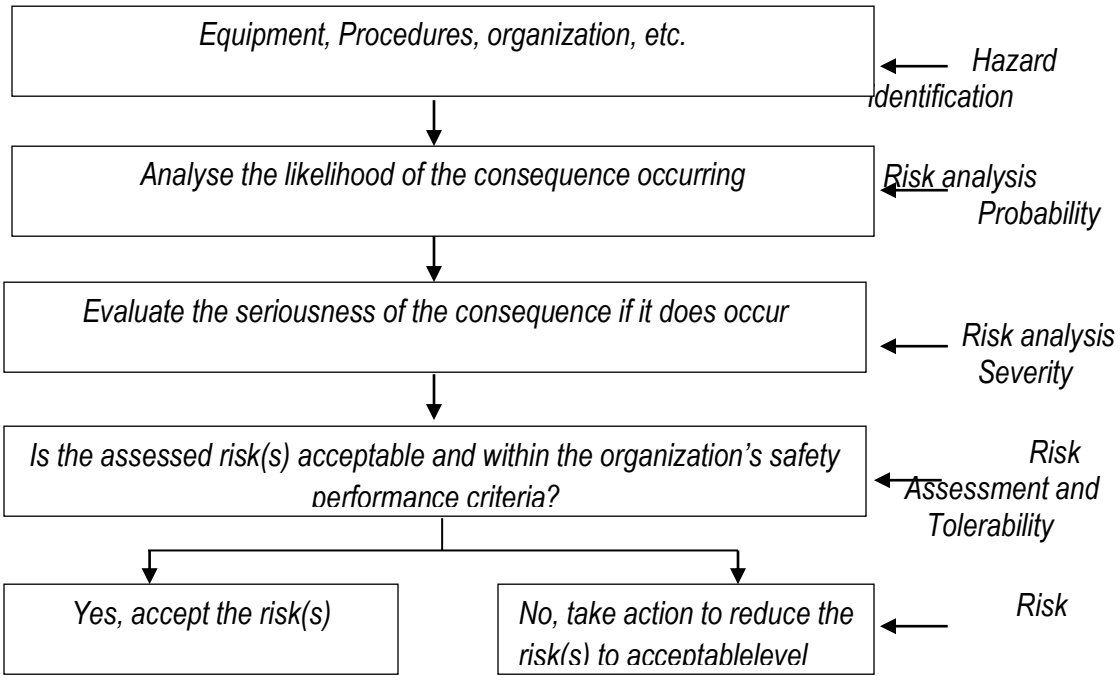
Risk assessment and mitigation processes analyse and eliminate or mitigate to an acceptable level, risks that could threaten the capability of an organisation to undertake its activities in a safe manner.

Once risks have been assessed, the service provider will engage in a decision-making process to determine the need to implement risk mitigation measures. This decision-making process involves the use of a risk categorization tool that may be in the form of an assessment matrix that should be used across the whole organisation. An example of a safety risk (index) assessment matrix is provided. Using this matrix, risks can be categorized according to an assessment of their potential severity and probability. The risk assessment matrix should be customized to reflect the context of each service provider's organizational structure and aviation activities and may be subject to agreement by the Authority.

If the assessed safety risks are deemed to be tolerable, appropriate action is taken and the operation continues. The completed hazard identification and safety risk assessment and mitigation process is documented and approved as appropriate and forms part of the safety information management system. However, the service provider should consider suspension of any activities that continue to expose the organization to intolerable safety risks in the absence of mitigating actions that reduce the risks to an acceptable level.

After safety risks have been assessed, appropriate mitigation measures can be implemented to manage them to an acceptable level. Mitigation measures may include a number of alternatives including, but not limited to, modifications to existing operating

procedures, training programmes or equipment used in the delivery of aviation products or services but must be balanced against the time, cost and difficulty of taking measures to reduce or eliminate the risk. Each risk mitigation exercise is to be documented progressively and should be approved by the appropriate level of management. A diagram showing the hazard analysis and risk assessment process is shown below:



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

Example of a safety risk (index) assessment matrix

Severity of Consequences		
Aviation definition	***Meaning***	***Value***
Catastrophic	*Aircraft / Equipment destroyed. Multiple deaths.*	***5***
Hazardous	*A large reduction in safety margins, physical distress or a workload such that organisations cannot be relied upon to perform their tasks accurately or completely. Serious injury or death to a number of people. Major equipment damage.*	***4***
Major	*A significant reduction in safety margins, a reduction in the ability of organisations 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	*Little consequence.*	***1***

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

Risk Classification	
Acceptable	*The consequence is so unlikely or not severe enough to be of concern; the risk is acceptable. However, consideration should be given to reducing the risk further to as low as reasonably practicable in order to further minimise the risk of an accident or incident.*
Review	*The consequence and/or likelihood is of concern; measures to mitigate the risk to as low as reasonably practicable should be sought. Where the risk is still in the review category after this action then the risk may be accepted, provided that the risk is understood and has the endorsement of the individual ultimately accountable for safety in the organisation.*
Unacceptable	*The likelihood and severity of the consequence is intolerable. Major mitigation will be necessary to reduce the likelihood and severity of the consequences associated with the hazard.*

Chapter 5

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 should continually monitor its internal processes as well as its operating environment to detect changes or deviations that may introduce emerging safety risks or the degradation of existing risk controls. Such changes or deviations should then be addressed together with the safety risk management process.

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

The three elements of Safety Assurance are:

3.1: Safety Performance Monitoring and Measurement;

3.2: The Management of Change;

3.3: Continuous Improvement of the SMS.

5.1: SMS Element 3.1: Safety Performance Monitoring and Measurement

The service provider should develop and maintain the means to verify the safety performance of the organization and to validate the effectiveness of safety risk controls. Therefore, one of the key functions of the SMS is assurance that the system is working and is effective and will involve:

- *The setting and monitoring of Safety Performance Indicators (SPIs) and Safety Performance Targets (SPTs) to measure the organisation's safety performance;*
- *The assessment of the effectiveness of the SMS by confirming that the mitigations, controls and defences put in place are working and effective to ensure safe operational practices;*
- *Monitoring compliance with the Nig. CARs and ICAO Annex 19 requirements on safety management.*

It is important to note that the implementation of the above stated may require that a complementary relationship between safety assurance and quality assurance (compliance monitoring) be established to allow for the integration of certain supporting services.

The necessity to establish safety objectives before setting SPIs and SPTs will allow the safety performance of the organisation to be measured against its safety policies and objectives.

Service Providers should consider the following when setting safety objectives:

- *Define what the organisation hopes to achieve;*
- *It should be a statement of a desired outcome;*
- *Safety objectives should be short, high-level statements of the safety priorities and should reflect the organisation's safety policy; and*
- *Safety objectives should address the organisation's most significant risks.*

Information used to measure the organization's safety performance is generated through its safety reporting systems which may include:

a) Mandatory and Voluntary Reporting Systems;

b) Safety studies;

c) Safety reviews including trend analysis;

d) Audits;

e) Surveys;

f) Internal safety investigations.

Safety Studies are *analysis used to gain an understanding of broad safety issues or those of a global nature. In safety studies, organisations can use already made recommendations on safety issues for its internal use.*

Safety reviews are a fundamental component of change management. They are conducted during the introduction and deployment of new technologies, new procedures or systemic changes that affect aviation operations.

Safety audits focuses on the integrity of the organisational SMS and its supporting systems and periodically assesses the status of safety risk controls and related quality assurance processes and also are used to ensure that the structure of the SMS is sound in terms of:

a) Adequate staff levels;
b) Compliance with approved procedures and instructions;
c) Levels of competency and training to carry out specific roles;
d) Maintaining required levels of performance;
e) Achievement of the safety policy and objectives;
f) Effectiveness of interventions and risk mitigations.

Safety surveys examine particular elements or processes of a specific operation and should be carried out as a matter of routine, to provide assurance of safe operational activity. They are used to identify issues or problems in daily operations and provide qualitative information that may require validation to determine appropriate corrective action as the information provided is usually subjective. Surveys may involve the use of:

a) Checklists;

b) Questionnaires;

c) Informal confidential interviews.

Internal safety investigationsare conducted for certain reportable safety events in accordance with internal or regulatory requirements and that are not required to be investigated or reported to the NCAA. However, in some instances organisations might be conducting an internal safety investigations not withstanding that the event in question is being investigated by the NCAA.

Scope of Internal Safety Investigations: The scale and scope of any investigation should be suitable to determine why an event occurred and validate or identify the underlying hazards. The level of investigation should be proportional to the identified hazard and risk.

Investigation Methodology: The investigation process should take place as soon as possible after the event. The objective of the investigation is to understand why an event happened and the contributing causes and not to apportion blame. The investigation should include:

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

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

5.2: SMS Element 3.2: The Management of Change

The service provider should 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. The organisation should utilise its existing risk management process to identify potential hazards that could impact safety. Change can also introduce new hazards that could impact the appropriateness and effectiveness of existing risk mitigations.

Organisations should define the types of changes that would require a formal management of change process. This should also include who makes the decision to start the process and who has the authority to sign it off.

5.3: SMS Element 3.3: Continuous Improvement of the SMS

To enable the continuous improvement of the overall performance of the SMS, the service provider should monitor and assess the effectiveness of its SMS processes. Continuous improvement is measured through the monitoring of an organization's safety performance indicators and is related to the maturity and effectiveness of an SMS.

Continuous improvement should be achieved through:

a) *Internal evaluations of the SMS, which will involve assessment of the service provider's aviation activities to provide information useful to the organization's decision-making processes. The internal evaluation function should include proactive evaluation of day to day operations, facilities, equipment, documentation, procedures and individual's performance to verify the fulfilment of their safety responsibilities. Such evaluations should be conducted by persons or organisations that are functionally independent of the technical processes being evaluated.*

b) *Internal audits of the SMS, which will involve the systematic and scheduled examination of the service provider's aviation activities, including those specific to implementation of the SMS. Internal audits should provide the accountable executive, as well as senior management officials responsible for the SMS, the ability to track the implementation and effectiveness of the SMS as well as its supporting systems and are most effective when conducted by persons or departments that are independent of the functions being evaluated.*

c) *External audits of the SMS conducted by the Authority and also by industry associations or other third parties selected by the service provider. These external audits should enhance the internal audit system as well as provide independent oversight.*

Chapter 6

SMS Component 4: Safety Promotion

Safety promotion should encourage a positive safety culture and create an environment that is conducive to the achievement of the service provider's safety objectives. This can only be achieved through the combination of personnel technical competence that is continually enhanced through training and education, effective communications and information sharing.

The two elements of Safety Promotion are:

4.1) Training and Education
4.2) Safety Communication

6.1: SMS Element 4.1: Training and Education

The service provider should develop and maintain a safety training programme that ensures that personnel are trained and competent to perform their SMS duties as the implementation of such is an indication of management's commitment to an effective SMS. The scope of the safety training programme should be appropriate to each individual's responsibility and involvement in the SMS. Training requirements consistent with the needs and complexity of the organization should be documented for each area of activity.

Training procedures should specify initial and recurrent safety training standards for all operational staff, managers, supervisors, senior managers and the accountable manager and be adequate to ensure that personnel are competent to perform their safety-related duties. A training file should be developed for each employee, including management.

Safety training and education curricula should consist of the following:

a) *Organizational safety policies, goals and objectives;*
b) *Organizational safety roles and responsibilities related to safety;*
c) *Basic safety risk management principles;*
d) *Safety reporting systems;*
e) *Safety management support (including evaluation and audit programmes);*
f) *Lines of communication for dissemination of safety information;*
g) *A validation process that measures the effectiveness of training; and*
h) *Documented initial indoctrination and recurrent training requirements.*

The safety training programme should include a session designed specifically for the accountable manager. This training session should be at a high level providing the accountable manager with an understanding of the SMS and its relationship to the organization.

6.2: SMS Element 4.2: Safety Communication

The service provider should establish and implement formal processes and procedures to facilitate effective communication throughout all levels of the organization primarily to communicate the organisation's SMS objectives and procedures to all personnel, ensure personnel are aware of the SMS to a degree commensurate with their positions, convey safety-critical information, explain the reasons for accomplishing certain safety actions and introducing or changing safety procedures.

Service providers should also encourage "bottom-up" communication, providing an environment that allows senior management to receive open and constructive feedback from operational personnel.

Means of safety information communication may include:

a) Safety policies and procedures (dissemination of SMS Manual);

b) Newsletters, safety bulletins and notices;

c) Presentations;

d) Websites and e-mails; and

e) Informal workplace meetings between staff and the accountable manager or senior managers.