Notice of Proposed Rule Making
of JCAR Part 19
Safety Management System

NPRM: Reg. 5/2021   **Release Date: 04/11/2021**

Jordan Civil Aviation Regulatory Commission (CARC) hereby releases a proposed re-issue of JCAR Part 19.

The objective of this NPRM is to announce the proposed issue and to seek concerned parties' comments and feedback regarding the above mentioned regulations and to facilitate enhanced public involvement in the rule making process.

CARC encourages comments concerning this proposal to be directed to the following email addresses:

Khalid.Al-zoubi@CARC.GOV.JO

Director Civil Aviation Regulations

The closing date of comments: 04/12/2021

Capt. Haitham Misto
Chief Commissioner/CEO
Civil Aviation Regulatory Commission

رکی

Record of Revisions

Amendment No.	Effective date	Subpart	Paragraph
Fist Issue	Aug. 2008	-	-
Re-Issue	2021		

Table of Contents

Abbreviations
(used in this Part)

AIS	:	Aeronautical Information Services
ALoSP	:	Acceptable Level of Safety Performance
AOC	:	Air Operator Certificate
ATM	:	Air Traffic Management
ATS	:	Air Traffic Service(s)
CARC	:	Jordan Civil Aviation Regulatory Commission
CNS	:	Communication, Navigation and Surveillance
ERP	:	Emergency Response Plan
FDA	:	Flight Data Analyses
FDM	:	Flight Data Monitoring
FRMS	:	Fatigue Risk Management Systems
ICAO	:	International Civil Aviation Organization
LOSA	:	Line Operations Safety Audit
MET	:	Meteorological Services for Air Navigation
QMS	:	Quality Management System
SAG	:	Safety Action Group
SAR	:	Search and Rescue
SD	:	Standard Deviation
SDCPS	:	Safety Data Collection and Processing System
SMS	:	Safety Management System
SPI	:	Safety Performance Indicator
SPT	:	Safety Performance Targets
SRM	:	Safety Risk Management
SSO	:	State Safety Oversight
SSP	:	State Safety Programme
STDEVP	:	Population Standard Deviation

Definitions

When the following terms are used in this part, they have the following meanings:

Acceptable Level of Safety Performance (ALoSP): The level of safety performance agreed by State authorities to be achieved for the civil aviation system in a State, as defined in its State safety programme, expressed in terms of safety performance targets and safety performance indicators.

Accident: An occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shutdown, in which:

(a) a person is fatally or seriously injured as a result of:
- being in the aircraft, or
- direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or
- direct exposure to jet blast,

except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or

(b) the aircraft sustains damage or structural failure which:
- adversely affects the structural strength, performance or flight characteristics of the aircraft, and
- would normally require major repair or replacement of the affected component, except for engine failure or damage, when the damage is limited to a single engine, (including its cowlings or accessories), to propellers, wing tips, antennas, probes, vanes, tires, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes), or for minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike (including holes in the radome); or

(c) the aircraft is missing or is completely inaccessible.

Note 1.— *For statistical uniformity only, an injury resulting in death within thirty days of the date of the accident is classified, by ICAO, as a fatal injury.*

Note 2.— *An aircraft is considered to be missing when the official search has been terminated and the wreckage has not been located.*

Note 3. – *the type of unmanned aircraft system to be investigated is addressed in 2201.39 of JCAR Part 2201.*

Note 4. – Guidance for determination of aircraft damage can be found in Appendix A of JCAR Part 2201.

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

Note – In the context of SMS, the Accountable Executive may be referred to as Accountable Manager.

Aeroplane: A power-driven heavier-than-air aircraft, deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight.

Note – within this Part the word Airplane is sometimes used as a an alternative to Aeroplane

Aircraft: Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

Change Management: A formal process to manage changes within an organization 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.

Note – within the context of SMS, Change Management can be referred to as Management of Change

Hazard:. A condition or an object with the potential to cause or contribute to an aircraft incident or accident.

Helicopter: A heavier-than-air aircraft supported in flight chiefly by the reactions of the air on one or more power-driven rotors on substantially vertical axes.

Note.— Some States use the term "rotorcraft" as an alternative to "helicopter".

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

> *Note.— The types of incidents which are of interest for safety-related studies include the incidents listed in 2201.25 of JCAR Part 2201.*

Industry Codes of Practice: Guidance material developed by an industry body, for a particular sector of the aviation industry to comply with the requirements of the International Civil Aviation Organization's Standards and Recommended Practices, other aviation safety requirements and the best practices deemed appropriate.

> *Note.— Some States accept and reference industry codes of practice in the development of regulations to meet the requirements of Annex 19, and make available, for the industry codes of practice, their sources and how they may be obtained.*

Operational personnel: Personnel involved in aviation activities who are in a position to report safety information.

> *Note.— Such personnel include, but are not limited to: flight crews; air traffic controllers; aeronautical station operators; maintenance technicians; personnel of aircraft design and manufacturing organizations; cabin crews; flight dispatchers, apron personnel and ground handling personnel.*

Risk Mitigation: The process of incorporating defences, preventive controls or recovery measures to lower the severity and/or likelihood of a hazard's projected consequence.

Safety: The state in which risks associated with aviation activities, related to, or in direct support of the operation of aircraft, are reduced and controlled to an acceptable level.

Safety Data: A defined set of facts or set of safety values collected from various aviation-related sources, which is used to maintain or improve safety.

> *Note.— Such safety data is collected from proactive or reactive safety-related activities, including but not limited to:*
>   *(a) accident or incident investigations;*
>   *(b) safety reporting;*
>   *(c) continuing airworthiness reporting;*
>   *(d) operational performance monitoring;*
>   *(e) inspections, audits, surveys; or*
>   *(f) safety studies and reviews.*

Safety Information: Safety data processed, organized or analysed in a given context so as to make it useful for safety management purposes.

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

Safety oversight: A function performed by a state to ensure that individuals and organizations performing an aviation activity comply with safety-related national laws and regulations.

Safety Performance: A State or a service provider's safety achievement as defined by its safety performance targets and safety performance indicators.

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

Safety Performance Target: The state or service provider's planned or intended target for a safety performance indicator over a given period that aligns with the safety objectives. (as defined in ICAO Doc. 9859).

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

Serious Injury: An injury which is sustained by a person in an accident and which:
  (a) requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received; or
  (b) results in a fracture of any bone (except simple fractures of fingers, toes or nose); or
  (c) involves lacerations which cause severe hemorrhage, nerve, muscle or tendon damage; or
  (d) involves injury to any internal organ; or
  (e) involves second or third degree burns, or any burns affecting more than 5 per cent of the body surface; or
  (f) involves verified exposure to infectious substances or injurious radiation.

Service provider: Term that refers to those organizations certified under the JCARs listed in 19.1 of this part.

State of design: The state having jurisdiction over the service provider responsible for the type design.

State of Manufacturer: The state having the jurisdiction over the service provider responsible the final assembly of the aircraft.

State of the Operator: The State in which the operator's principal place of business is located or, if there is no such place of business, the operator's permanent residence.

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

Surveillance: The state activities through which the state proactively verifies through inspections and audits that aviation license, certificate, authorization or approval holders continue to meet the established requirements and function at the level of competency and safety required by the state.

Subpart A - General

19.10 Applicability

This part of civil aviation regulations outlines the Safety Management System requirements for Jordanian Aviation service providers and certificate holders who are certified or permitted to conduct aviation services in accordance with the following parts:

JCAR Part ARO, Aviation Recreation Organization;

JCAR Part FCL 1, Flight Crew Licensing (Aeroplane);

JCAR Part FCL 2, Flight Crew Licensing (Helicopter);

JCAR Part FSTD (A), Airplane Flight Simulator Devices (Aeroplanes);

JCAR Part FSTD (H), Airplane Flight Simulator Devices (Helicopter);

JCAR Part OPS 1, Commercial Air Transportation (Aeroplanes);

JCAR Part OPS 3, Commercial Air Transportation (Helicopters);

JCAR Part 142, Training Centers;

JCAR Part 21, Certification of Aircraft and Related Products, Parts and Appliances, and of Design and Production Organizations;

JCAR Part M, Continuing Airworthiness Management;

JCAR Part 145, Approved Maintenance Organizations;

JCAR Part 147, Maintenance Training Organization;

JCAR Part 138, Air Ambulance Services;

JCAR Part139, Airport Design, Operations and Certification;

JCAR Part 140, Ground Handling Services;

JCAR Part 171, Aeronautical Telecommunication Facilities;

JCAR Part 172, Air Navigation Service Standards;

JCAR Part FCL 3, Flight Crew Licensing;

JCAR Part MED, Class 3 Medical Certificate.

Within the context of this part; no provision is intended to transfer to the CARC the responsibilities of the service provider. This includes functions related to, or in direct support of, the safe operation of aircraft.

> *Note 1.— The provision of AIS, CNS, MET and/or SAR services, when under the authority of an ATS provider, are included in the scope of the ATS provider's SMS. When the provision of AIS, CNS, MET and/or SAR services are wholly or partially provided by an entity other than an ATS provider, the related services that come under the authority of the ATS provider, or those aspects of their services with direct operational implications, are included in the scope of the ATS provider's SMS.*

> *Note 2.— Where the service provider holds more than one certificate, the safety management system shall be combined and integrated with that required under the additional certificate (s) held. Service providers shall include in their safety management system, the activities conducted under their other approval(s) such as JCAR Part M and/or JCAR Part 145 Approvals for an AOC holder under JCAR Part OPS 1.*

19.30 General Requirements

19.31 Each Service Provider and certificate holder identified in 19.10 shall establish and maintain a Safety Management System (SMS) in accordance with the framework components and elements contained in Subpart B.

19.32 The service providers SMS shall be commensurate with the size of the organization and the complexity of its aviation products or services.

> *Note 1 - All components and all elements of SMS are interconnected and interdependent, and necessary to function effectively. The provisions of this JCAR are designed to provide the minimum requirements to be met by all Service Providers, regardless of the size and complexity of their civil aviation activities. The Service provider's SMS including the policies, processes and procedures should reflect the size and complexity of the organization and its activities.*

> *Note 2 – Scalability (Size, nature and complexity of the activity)*
> *Within the context of this JCAR, service providers in terms of their size, nature and complexity of activities will be classified into complex or non-complex subject to the following assessment:*
> *(a) for complex service provider*
>   *(1) the service provider reference to its size shall be assessed as complex when:*
>   *(i) it has a workforce of more than 20 full time equivalents;. or*
>   *(ii) It has more than one station or base.*

(2) Notwithstanding the size of the service provider, the following complexity criteria should be also assessed:
  (i) extent and scope of contracted activities.
  (ii) Extent and scope of certificates hold by the service provider
(3) Notwithstanding the size of the service provider, the following risk criteria should also be assessed:
  (i) use of special approvals;
  (ii) different types of equipment operated or used;
  (iii)   the environment in which the activities are conducted

Note 3 - *Notwithstanding the criteria above, the following service providers should be considered as non complex:*
  (a) Aviation Recreation Organization certified under JCAR Part ARO;
  (b) Airplane Flight Simulator Devices (Aeroplanes) certified under JCAR Part FSTD (A) ;
  (c) Training Centers Organization certified under JCAR Part 142, and;
  (d) Maintenance Training Organization certified under JCAR Part 147;

Note 2 - *The service provider should carry out an analysis of its activities to determine the right level of resources to manage the SMS. This should include the determination of the organizational structure needed to manage the SMS. This would include considerations of who will be responsible for managing and maintaining the SMS, what safety committees are needed, if any, and the need for specific safety specialists.*

19.33 SMS components outlined in Subpart B of this part, shall be verified by CARC for adequacy, scalability and effectiveness.

Note 1 - *Service providers are responsible for developing implementation plan to ensure satisfactory compliance by the this part provisions. In order to determine the acceptability of the SMS, the CARC should allow for scalability based on the size, operational environment and complexity of the operation.*

Note 2 - *As the establishment of the Safety Management System requires time, new organizations and organizations that are transitioning from traditional safety programme to an integrated SMS should follow a phased approach. Appendix A provides a guidance of how a phased approach towards SMS implementation may be established for organizations not having SMS. While sequencing the establishment of the different elements is left to the organization, the CARC expects elements mentioned under Phase 1 to be provided at the time of application. Upon completion of the phases, the CARC will check the SMS for effectiveness.*

Subpart - B - Framework For A Safety Management System (SMS)

This Subpart specifies the framework for the implementation and maintenance of a SMS which shall be met by the service providers. The framework comprises four components and twelve elements as the minimum requirements for SMS implementation.

> *Note - In accordance with 19.33 these components will be verified by the CARC for adequacy and scalability. After completion of all required implementation phases and availability of sufficient data, the components will be evaluated and assessed for effectiveness. Appendix B provides a process guidance for the initial acceptance and the ongoing compliance of an individual service provider's SMS to ensure that its framework is consistent with CARC's SSP framework. Such initial review and acceptance will be marked through an endorsement or acceptance of the organization's SMS manual. Such an acceptance process may be done on a phased basis where appropriate. CARC's directorates responsible for certifying service providers may deviate from the acceptance/assessment questions outlined in this appendix.*

19.100 Safety Policy and Objectives

The first component of the SMS framework focuses on creating an environment where safety management can be effective. It is founded on a safety policy and objectives that set out senior management's commitment to safety, its goals and the supporting organizational structure.

19.101 Management commitment

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

      (1) reflect the service provider's commitment regarding safety, including the promotion of a positive safety culture;

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

      (3) include safety reporting procedures;

      (4) 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;

      (5) define the safety objectives of the service provider that form the basis for safety performance monitoring and measurement as required by 19.301;

      (6) reflect the service provider's commitment to maintain or continuously improve the overall effectiveness of the SMS;

      (7) reflect the service provider's commitment to ensure safety is a primary responsibility of all managers;

(8) reflect the service provider's commitment to ensure that the safety policy is understood, implemented and maintained at all levels.

(9) be signed by the accountable executive of the organization;

(10) be communicated, with visible endorsement, throughout the organization; and

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

Note—Safety objectives should be short, high-level statements of the organization's safety priorities and should address its most significant safety risks. Safety objectives may be included in the safety policy (or documented separately), and requires the establishment of safety objectives defining what the service provider intends to achieve in terms of safety management.

19.102 Safety accountability and responsibilities

(a) The service provider shall establish the safety structure necessary for the implementation and maintenance of its SMS.

(b) The service provider shall identify the safety responsibilities of all members of senior management, irrespective of other responsibilities.

(c) Safety-related positions, responsibilities and authorities shall be defined, documented and communicated throughout the organization.

(d) The service provider shall:

(1) identify the accountable executive who, irrespective of other functions, is accountable on behalf of the service provider for the implementation and maintenance of an effective SMS;

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

(3) identify the responsibilities of all members of management, irrespective of other functions, as well as of employees, with respect to the safety performance of the service provider;

(4) document and communicate safety accountability, responsibilities and authorities throughout the service provider; and

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

Note.— The term "accountability" refers to obligations which cannot be delegated. The term "responsibilities" refers to functions and activities which may be delegated.

(e) The accountable executive shall have the following safety accountabilities:

(1) provide enough financial and human resources for the proper implementation of an effective SMS;

(2) promote a positive safety culture;

    (3)   establish and promote the safety policy;

    (4)   establish the organization's safety objectives;

    (5)   ensure the SMS is properly implemented and performing to requirements; and

    (6)   see to the continuous improvement of the SMS.

    (7)   ensuring safety policies are appropriate and communicated;

    (8)   ensuring necessary allocation of resources (financing, personnel, training, acquisition); and

    (9)   setting of the acceptable safety risk limits and resourcing of necessary controls.

(f) The accountable executive shall have as a minimum; the final authority:

    (1)   for the resolution of all safety issues; and

    (2)   over operations under the certificate/approval of the service provider, including the authority to stop the operation or activity.

Note — Authority to make safety risk tolerability decisions should be commensurate with the manager's general decision-making and resource allocation authority. A lower level manager may be authorized to make tolerability decisions up to a certain level. Risk levels that exceed the manager's authority must be escalated for consideration to a higher management level with greater authority.

19.103 Appointment of key safety personnel

(a) The service provider shall appoint a safety manager who is accepted to the CARC, and responsible for the implementation and maintenance of the SMS.

(b) The safety manager's functions shall include, but not limited to, the following:

    (1)   managing the SMS implementation plan on behalf of the accountable executive (upon initial implementation);

    (2)   performing/facilitating hazard identification and safety risk analysis;

    (3)   monitoring corrective actions and evaluate their results;

    (4)   providing periodic reports on the service provider's safety performance;

    (5)   maintaining SMS documentation and records;

    (6)   planning and facilitating staff safety training;

    (7)   providing independent advice on safety matters;

    (8)   monitoring safety concerns in the aviation industry and their perceived impact on the service provider's operations aimed at product and service delivery;

    (9)   coordination and communication (on behalf of the accountable executive) with the CARC and other State authorities as necessary on issues relating to safety.

    (10) ensuring safety promotion throughout the organization, and;

    (11) managing the processes of SDCPS, and ensuring that they are implemented.

Note 1.— Depending on the size of the service provider and the complexity of its aviation products or services, the responsibilities for the implementation and maintenance of the SMS may be assigned to one or more persons, fulfilling the role of safety manager, as their sole function or combined with other duties, provided these do not result in any conflicts of interest. In cases where the function is allocated to a group of persons, (e.g. when service providers extend their SMS across multiple activities) one of the persons should be designated as "lead" safety manager, to maintain a direct and unequivocal reporting line to the accountable executive.

Note 2—Depending on the size, nature and complexity of the service provider the safety manager role may be an exclusive function or it may be combined with other duties. The service provider must ensure that the option chosen does not result in any conflicts of interest. The safety manager should not be directly involved in the product or service delivery but should have a working knowledge of these. The appointment should also consider potential conflicts of interest with other tasks and functions. In such cases where the SMS manager is involved in other functions, a prior approval from CARC shall be made.

(c) The competencies for a safety manager shall include, but not be limited to, the following:
   (1) safety/quality management experience;
   (2) detailed knowledge of SMS;
   (3) operational experience related to the product or service provided by the organization;
   (4) technical background to understand the systems that support operations or the product/service provided;
   (5) interpersonal skills;
   (6) analytical and problem-solving skills;
   (7) project management skills;
   (8) oral and written communications skills; and
   (9) an understanding of human factors.

(d) In order to ensure a formal process to assess the effectiveness and efficiency of any mitigation strategies used to achieve the agreed safety performance targets of the organization as required by 19.301. The service providers shall establish a safety review committees (SRC) that support the SMS functions across the organization. The SRC:
   (1) monitors the effectiveness of the SMS;
   (2) monitors that any necessary corrective action is taken in a timely manner;
   (3) monitors safety performance against the organization's safety policy and objectives;

(4) monitors the effectiveness of the organization's safety management processes which support the declared corporate priority of safety management as another core business process;

(5) monitors the effectiveness of the safety supervision of subcontracted operations; and

(6) ensures that appropriate resources are allocated to achieve safety performance beyond that required by regulatory compliance.

Note - The SRC is a very high-level committee, chaired by the accountable executive and composed of senior managers, including line managers responsible for functional areas as well as those from relevant administrative departments. The safety manager participates in the SRC in an advisory capacity only

(e) in order to implement the safety strategies developed by the SRC, in a coordinated manner and throughout the organization; the service provider shall establish safety action group(s) (SAGs). The SAG:

(1) oversees operational safety performance within the functional areas of the organization and ensures that appropriate safety risk management activities are carried out with staff involvement as necessary to build up safety awareness;

(2) coordinates the resolution of mitigation strategies for the identified consequences of hazards and ensures that satisfactory arrangements exist for safety data capture and employee feedback;

(3) assesses the safety impact related to the introduction of operational changes or new technologies;

(4) coordinates the implementation of corrective action plans and ensures that corrective action is taken in a timely manner;

(5) reviews the effectiveness of previous safety recommendations; and

(6) oversees safety promotion activities as necessary to increase employee awareness of safety issues and to ensure that they are provided appropriate opportunities to participate in safety management activities.

Note - SAGs are tactical entities that deal with specific implementation issues per the direction of the SRC, they are composed of line managers and front-line personnel and are normally chaired by a designated line manager.

19.104 Coordination of emergency response planning

(a) The service provider required to establish and maintain an emergency response plan for accidents and incidents in aircraft operations and other aviation emergencies in accordance with other JCARs requirements, shall develop as part of the safety policy, an emergency response plan that addresses at least the following:

(1)   Delegation of emergency authority;

(2)   Assignment of emergency responsibilities;

(3)   documentation of emergency procedures and processes;

(4)   Safe continuation of essential operations, while the crisis is being managed; and

(5)   Proactive identification of all possible emergency events/ scenarios and their corresponding mitigation actions.

(b) The service provider required to establish and maintain an emergency response plan for accidents and incidents in aircraft operations and other aviation emergencies in accordance with other JCARs requirements, shall ensure that the emergency response plan:

(1)   Is appropriate to the size, nature and complexity of the organization;

(2)   Is readily accessible to all relevant personnel and other organizations where applicable;

(3)   include checklists and procedures relevant to specific emergency situations;

(4)   have quick-reference contact details of relevant personnel;

(5)   is regularly tested through exercises; and;

(6)   is periodically reviewed and updated when details change

(c) The service provider required to establish and maintain an emergency response plan for accidents and incidents in aircraft operations and other aviation emergencies in accordance with other JCARs requirements, shall ensure that the emergency response plan is properly coordinated with the emergency response plans of those organizations it must interface with during the provision of its products and services.

19.105 SMS documentation

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

Note – for more information regarding SMS implementation plan, refer to 19.33Note 2.

(b) The service provider shall develop and maintain an SMS manual that describes its:

(1)   safety policy and objectives;

(2)   SMS requirements;

(3)   SMS processes and procedures; and

(4)   accountability, responsibilities and authorities for SMS processes and procedures.

(5)   SMS outputs.

(c) The service provider shall develop and maintain SMS operational records as part of its SMS documentation.

Note – an expanded guidance to SMS documentation is found in Appendix C.

19.200 Safety Risk Management

The second component of the SMS framework focuses on the standards required by a service provider to 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.

19.201 Hazard identification

(a)   The service provider shall develop and maintain a formal process to identify hazards associated with its aviation products or services.

Note - *The methods used to identify hazards will typically depend on the resources and constraints of each particular organization. Some organizations might deploy comprehensive, technology-intensive hazard identification processes, while service providers with smaller, less complex operations might implement more modest hazard identification processes. Regardless of organizational size or complexity, to ensure all hazards are identified to the extent possible, hazard identification processes are necessarily formalized, coordinated and consistently applied on an on-going basis in all areas of the organization where there is a potential for hazards that could affect safe operations, services or products.*

(b)   The service provider's Hazard identification process shall be based on a combination of reactive and proactive methods.

Note 1 - *There are a variety of sources for hazard identification, internal or external to the organization. Some internal sources include:*
(i) Normal operations monitoring; this uses observational techniques to monitor the day to day operations and activities such as line operations safety audit (LOSA).
(ii) Automated monitoring systems; this uses automated recording systems to monitor parameters that can be analysed such as flight data monitoring (FDM).
(iii)Voluntary and mandatory safety reporting systems; this provides everyone, including staff from external organizations, with opportunities to report hazards and other safety issues to the organization.

(iv) *Audits; these can be used to identify hazards in the task or process being audited. These should also be coordinated with organizational changes to identify hazards related to the implementation of the change.*

(v) *Feedback from training; training that is interactive (two way) can facilitate identification of new hazards from participants.*

(vi) *Service provider safety investigations; hazards identified in internal safety investigation and follow-up reports on accidents/incidents.*

Note 2 - Examples of external sources for hazard identification include:

(i) *Aviation accident reports; reviewing accident reports, this may be related to accidents in the same State or to a similar aircraft type, region or operational environment.*

(ii) *State mandatory and voluntary safety reporting systems.*

(iii) *State oversight audits and third-party audits; external audits can sometimes identify hazards. These may be documented as an unidentified hazard or captured less obviously within an audit finding.*

(iv) *Trade associations and information exchange systems; many trade associations and industry groups are able to share safety data that may include identified hazards.*

(c) The service provider shall have an internal safety reporting system that is implemented throughout the organization in a manner that:

(1) Encourages and facilitates personnel to submit reports that identify safety hazards, expose safety deficiencies and raise safety concerns;

(2) Ensures mandatory reporting in accordance with applicable regulations;

(3) Includes analysis and management action as necessary to address safety issues identified through the reporting system;

(4) Include a confidential safety reporting system that is implemented throughout the organization in a manner that encourages and facilitates the reporting of events, hazards and/or concerns resulting from or associated with human performance in operations, and;

(5) Include a non-punitive safety reporting system that is implemented throughout the organization in all areas where operations are conducted, and assures employees that the reporting of unintentional errors does not result in disciplinary or punitive action being taken against the reporter or other individuals involved unless such errors result from illegal activity, willful misconduct or other egregious actions, as defined by the service provider's policy and as required in 19.101 (a) (4).

(d) The service provider shall establish, develop and maintain a process to conduct internal safety investigations in response to reported incidents and hazards for identifying causal and contributing factors, and how to prevent any recurrence.

Note - *There is a clear distinction between accident and incident investigations under JCAR Part 2201 and service provider safety investigations. Investigation of accidents and serious incidents under JCAR Part 2201 are the responsibility of the CARC, as defined in JCAR Part 2201. This type of information is essential to disseminate lessons learned from accidents and incidents. Service provider safety investigations are conducted by service providers as part of their SMS to support hazard identification and risk assessment processes. There are many safety occurrences that fall outside of JCAR Part 2201 that could provide a valuable source of hazard identification or identify weaknesses in risk controls. These problems might be revealed and remedied by a safety investigation led by the service provider.*

19.202 Safety risk assessment and mitigation

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

(b) The risks in each hazard identified through the hazard identification processes described in 19.201 of this part shall be analyzed in terms of probability and severity of anticipated consequences, and assessed for their tolerability.

(c) The service provider shall define safety control for each risk assessed as intolerable.

19.300 Safety Assurance

The third component of SMS framework is Safety assurance that consists of processes and activities undertaken to determine whether the SMS is operating according to expectations and requirements. This involves continuously monitoring its processes as well as its operating environment to detect changes or deviations that may introduce emerging safety risks or the degradation of existing safety risk controls. Such changes or deviations may then be addressed through the SRM process.

19.301 Safety performance monitoring and measurement

(a) The service provider shall develop and maintain the means to verify the safety performance of the organization and to validate the effectiveness of safety risk controls.

(b) The service provider's SMS shall identify:

      (1)   Safety objectives, which shall be established first to reflect the strategic achievements or desired outcomes related to safety concerns specific to the organization's operational context;

      (2)   SPIs, which are tactical parameters related to the safety objectives and therefore are the reference for data collection; and

      (3)   SPTs, which are also tactical parameters used to monitor progress towards the achievement of the safety objectives.

(c) The service provider's safety performance shall be verified in reference to the safety performance indicators and safety performance targets of the SMS in support of the organization's safety objectives.

(d) Safety performance monitoring and measurement means shall include, but not limited to; the following:

      (1)   Safety studies;

      (2)   Safety data analyses derived from safety reporting data;

      (3)   Safety surveys;

      (4)   Safety audits;

      (5)   Findings and recommendations from safety investigations, and;

      (6)   Operational data collection. such as (FDA)

Note - The complementary relationship between safety assurance and quality assurance audit activities 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.

(e) The service provider's safety assurance activities shall include the development and implementation of corrective actions in response to findings of systemic deficiencies having a potential safety impact.

(f) The service provider's over all safety performance, including The SPIs, SPTs, alert levels and relevant action plans made to meet the service provider's safety objectives shall be periodically provided to the CARC for monitoring purposes and to be agreed upon in order to establish and monitor the State ALoSP required in accordance to Jordan's SSP.

Note - Guidance on the development of safety performance indicators and their target and alert settings are addressed in Appendix D.

19.302 The management of change

(a) The service provider shall develop and maintain a 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.

(b) The service provider shall define the trigger for the formal change process. Changes that are likely to trigger formal change management include, but not limited to, the following:
(i)   introduction of new technology or equipment;
(ii)   changes in the operating environment;
(iii) changes in key personnel;
(iv)   significant changes in staffing levels;
(v)   changes in safety regulatory requirements;
(vi)   significant restructuring of the organization; and
(vii) physical changes (new facility or base, aerodrome layout changes etc.).

(c) The service provider change management process shall include the following activities:
(1)   provide a description of the change and why it is being implemented;
(2)   define who and what it will affect. A review of the system description and organizations interfaces may be needed.;
(3)   identify hazards related to the change and carry out a safety risk assessment, this should identify any hazards directly related to the change. The impact on existing hazards and safety risk controls that may be affected by the change shall also be reviewed. This step shall use the existing organization's SRM processes;
(4)   develop an action plan, this shall define what is to be done, by whom and by when. There shall be a clear plan describing how the change will be implemented and who will be responsible for which actions, and the sequencing and scheduling of each task;
(5)   sign off on the change, this is to confirm that the change is safe to implement. The accountable executive shall sign the change plan; and
(6)   develop an assurance plan, this is to determine what follow up action is needed. Consider how the change will be communicated and whether additional activities (such as audits) are needed during or after the change.
(7)   Examining any assumptions made and need to be tested.

19.303 Continuous improvement of the SMS

(a) The service provider shall monitor and assess its SMS processes to maintain or continuously improve the overall effectiveness of the SMS.

(b) The service providers shall implement a variety of methods to determine its SMS effectiveness, measure outputs as well as outcomes of the processes, and assess the information gathered through these activities. Such methods include, but not limited to, the following:

(1) Audits; this includes internal audits and audits carried out by other organizations.

(2) Assessments; includes assessments of safety culture and SMS effectiveness.

(3) Monitoring of occurrences: this include the recurrence of safety events including accidents and incidents as well as errors and rule-breaking situations.

(4) Safety surveys; including cultural surveys providing useful feedback on staff engagement with the SMS. It may also provide an indicator of the safety culture of the organization.

(5) Management reviews: that examine whether the safety objectives are being achieved by the organization and is an opportunity to look at all the available safety performance information to identify overall trends. It is important that senior management review the effectiveness of the SMS. This may be carried out as one of the functions of the highest-level safety committee.

(6) Evaluation of SPIs and SPTs; possibly as part of the management review, it considers trends and, when appropriate data is available, can be compared to other service providers or State or global data.

(7) Addressing lessons learnt; from safety reporting systems and service provider safety investigations. These should lead to safety improvements being implemented.

19.400 Safety promotion

19.401 Training and education

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

(b) The service provider SMS training programme shall include initial and recurrent training requirements to maintain competencies, as following:

(1) Initial safety training that shall consider, as a minimum, the following:

(i)   *organizational safety policies and safety objectives;*

(ii) *organizational roles and responsibilities related to safety;*

(iii) *basic SRM principles;*

(iv) *safety reporting systems;*

(v)   *the organization's SMS processes and procedures; and*

(vi) *human factors.*

(2) Recurrent safety training that shall focus on changes to the SMS policies, processes and procedures, and should highlight any specific safety issues relevant to the organization or lessons learnt.

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

(d) the service provider shall develop and conduct a specific safety training for the accountable executive and senior managers that include the following topics:
   (1) specific awareness training for new accountable managers and post holders on their SMS accountabilities and responsibilities;
   (2) importance of compliance with national and organizational safety requirements;
   (3) management commitment;
   (4) allocation of resources;
   (5) promotion of the safety policy and the SMS;
   (6) promotion of a positive safety culture;
   (7) effective inter-departmental safety communication;
   (8) safety objective, SPTs and alert levels; and
   (9) disciplinary policy.

19.402 Safety communication
(a) The service provider shall develop and maintain a formal means for safety communication that:
   (1) ensures personnel are aware of the SMS to a degree commensurate with their positions;
   (2) conveys safety-critical information;
   (3) explains why particular actions are taken to improve safety; and
   (4) explains why safety procedures are introduced or changed.

(b) The Service provider shall assess the effectiveness of their safety communication by checking personnel have received and understood any safety critical information that has been distributed. This can be done as part of the internal audit activities or when assessing the SMS effectiveness.

Appendix A - SMS Phased Implementation Plan

The objective of this APPENDIX is to introduce CARCs expectations of the four SMS implementation phases. The implementation of an SMS is a systematic process. Nevertheless, this process may be quite a challenging task depending on factors, such as the availability of guidance material and resources required for implementation, as well as the service provider's pre-existing knowledge of SMS processes and procedures.

The reasons for a phased approach to SMS implementation include:
   a) the provision of a manageable series of steps to follow in implementing an SMS, including allocation of resources;
   b) the need to allow implementation of SMS framework elements in various sequences, depending upon the results of each service provider's gap analysis;
   c) the initial availability of data and analytic processes to support reactive, proactive and predictive safety management practices; and
   d) the need for a methodical process to ensure effective and sustainable SMS implementation.

The phased approach recognizes 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.

PHASE 1
This phase is expected to be completed when the service provider apply for its SMS to CARC

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 organization'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 organization 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. At the completion of Phase 1, the following activities should be finalized in such a manner that meets the expectations of CARC, as set forth in relevant requirements and guidance material:

Management commitment - 19.101
(a) Identify the accountable executive and the safety accountabilities of managers. This activity is based on Elements 19.101 and 19.102 of the SMS framework.

(b) Establish an SMS implementation team. The team should be comprised of representatives from the relevant departments. The team's role is to drive the SMS implementation from the planning stage to its final implementation. Other functions of the implementation team will include but not be limited to:

    (1) developing the SMS implementation plan;

    (2) ensuring the adequate SMS training and technical expertise of the team in order to effectively implement the SMS elements and related processes; and

    (3) monitoring of and reporting on the progress of the SMS implementation, providing regular updates and coordinating with the SMS accountable executive.

(c) Define the scope of the organization's activities (departments/divisions) to which the SMS will be applicable. The scope of the organization's SMS applicability will subsequently need to be described in the SMS document as appropriate. This activity is based on Element 19.105 of the SMS framework.

(d) Conduct a gap analysis of the organization's current systems and processes in relation to the JCAR 19 SMS framework requirements.
Note - Guidance on an SMS gap analysis for a service provider is provided in ICAO Doc 9859 - Appendix 7 to Chapter 5 .

SMS implementation plan - Element 19.105 (a)
Develop an SMS implementation plan on how the organization will implement the SMS on the basis of the identified system and process gaps resulting from the gap analysis.

Appointment of key safety personnel - Element 19.103
(a) Identify the key SMS person (safety/quality function) within the organization who will be responsible for administering the SMS on behalf of the accountable executive.

(b) Establish the safety services office.

Training and education - Element 9.401 (a)
(a) Conduct a training needs analysis.

(b) Organize and set up schedules for appropriate training of all staff according to their individual responsibilities and involvement in the SMS.

(c) Develop safety training considering:
    (1) initial (general safety) job-specific training; and
    (2) recurrent training.

(d) Identify the costs associated with training.

(e) Develop a validation process that measures the effectiveness of training.

(f) Establish a safety training records system.

Safety communication - Element 9.402 (a)
(a) Initiate a mechanism or medium for safety communication.

(b) Establish a means to convey safety information through any of:
    (1) safety newsletters, notices and bulletins;
    (2) websites;
    (3) email.

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 organizations 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.

Management commitment and responsibility — Element 9.101 (b)
(a) Develop a safety policy.

(b) Have the accountable executive sign the safety policy.

(c) Communicate the safety policy throughout the organization.

(d) Establish a review schedule for the safety policy to ensure it remains relevant and appropriate to the organization.

(e) Establish safety objectives for the SMS by developing safety performance standards in terms of:
    (1) safety performance indicators;
    (2) safety performance targets and alert levels; and
    (3) action plans.

(f) Establish the SMS requirements for subcontractors:
    (1) establish a procedure to write SMS requirements into the contracting process; and
    (2) establish the SMS requirements in the bidding documentation.

Safety accountabilities — Element 19.102
(a) Define safety accountabilities and communicate them throughout the organization.

(b) Establish the safety action group (SAG).

(c) Establish the safety/SMS coordination committee.

(d) Define clear functions for the SAG and the safety/SMS coordination committee.

(e) Establish lines of communication between the safety services office, the accountable executive, the SAG and the safety/SMS coordination committee.

(f) Appoint the accountable executive as the chairperson of the safety/SMS coordination committee.

(g) Develop a schedule of meetings for the safety services office to meet with the safety/SMS coordination committee and SAG as needed.

Coordination of emergency response planning - Element 19.104
(a) Review the outline of the ERP related to the delegation of authority and assignment of emergency responsibilities.

(b) Establish coordination procedures for action by key personnel during the emergency and the return to
normal operations.

(c) Identify external entities that will interact with the organization during emergency situations.

(d) Assess the respective ERPs of the external entities.

(e) Establish coordination between the different ERPs.

(f) Incorporate information about the coordination between the different ERPs in the organization's SMS documentation.

SMS documentation - Element 19.105 (b)
Create an SMS documentation system to describe, store, retrieve and archive all SMS-related
information and records by:

(a) developing an SMS document that is either a stand-alone manual or a distinct section within an existing controlled organization manual (refer to Appendix C for guidance on developing an SMS manual);

(b) establishing an SMS filing system to collect and maintain current records relating to the organization's ongoing SMS processes;

(c) maintaining records to provide a historical reference as well as the current status of all SMS processes such as: a hazard register; an index of completed safety assessments; SMS/safety training records; current SPIs and associated safety objectives; internal SMS audit reports; SMS/safety committee meeting minutes and the SMS implementation plan;

(d) maintaining records that will serve as evidence of the SMS operation and activities during internal or external assessment or audit of the SMS.

PHASE 3

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

Hazard identification - Element 19.201 (a)
(a) Establish a voluntary reporting procedure.

(b) Establish a programme/schedule for systematic review of all applicable aviation safety-related processes/equipment that are eligible for the HIRM process.

(c) Establish a process for prioritization and assignment of identified hazards for risk mitigation.

Safety risk assessment and mitigation - Element 19.202
(a) Establish a safety risk management procedure, including its approval and periodic review process.

(b) Develop and adopt safety risk matrices relevant to the organization's operational or production processes.

(c) Include adopted safety risk matrices and associated instructions in the organization's SMS or risk management training material.

Safety performance monitoring and measurement - Element 19.301 (a)

(a) Establish an internal occurrence reporting and investigation procedure. This may include mandatory or major defect reports where applicable.

(b) Establish safety data collection, processing and analysis of high-consequence outcomes.

(c) Establish high consequence safety indicators and their associated target and alert settings. Examples of high-consequence safety indicators are accident rates, serious incident rate sand monitoring of high risk non-compliance outcomes.

(d) Reach an agreement with the State oversight authority on safety performance indicators and safety performance targets.

The management of change - Element 19.302

(a) Establish a formal process for the management of change that considers:
  (1) the vulnerability of systems and activities;
  (2) the stability of systems and operational environments;
  (3) past performance;
  (4) regulatory, industry and technological changes.
(b) Ensure that management of change procedures address the impact on existing safety performance and risk mitigation records before implementing new changes.
(c) Establish procedures to ensure that safety assessment of new aviation safety-related operations, processes and equipment are conducted (or accounted for) as applicable, before they are commissioned.

Continuous improvement of the SMS - Element 19.303

(a) Develop forms for internal evaluations.
(b) Define an internal audit process.
(c) Define an external audit process.
(d) Define a schedule for evaluation of facilities, equipment, documentation and procedures to be completed through audits and surveys.
(e) Develop documentation relevant to operational safety assurance.

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.

Management commitment and responsibility - Element 19.101

Enhance the existing disciplinary procedure/policy with due consideration of unintentional errors/mistakes from deliberate/gross violations.

Hazard identification - Element 19.201 (b)

(a) Integrate the hazards identified from occurrence investigation reports with the voluntary reporting system.

(b) Integrate hazard identification and risk management procedures with the subcontractor or customer SMS where applicable.

(c) If necessary, develop a process for prioritizing collected hazards for risk mitigation based on areas of greater need or concern.

Safety performance monitoring and measurement - Element 19.301 (b)

(a) Enhance the safety data collection and processing system to include lower-consequence events.

(b) Establish lower-consequence safety/quality indicators with target/alert level monitoring as appropriate.

(c) Reach an agreement with the State oversight authority on lower-consequence safety performance indicators and safety performance target/alert levels.

Continuous improvement of the SMS - Element 19.303

(a) Establish SMS audits or integrate them into existing internal and external audit programmes.

(b) Establish other operational SMS review/survey programmes where appropriate.

Training and education - Element 19.401 (b)

Complete an SMS training programme for all relevant personnel.

Safety communication - Element 19.402 (b)

Establish mechanisms to promote safety information sharing and exchange internally and externally.

SMS elements progressively implemented throughout Phases 1 to 4

In the phased approach implementation, the following three key elements are progressively implemented throughout each phase:

SMS documentation - Element 19.105

As the SMS progressively matures the relevant SMS manual and safety documentation must be revised and updated accordingly. This activity will be inherent to all phases of SMS implementation and must be maintained after implementation as well.

Training and education - Element 19.401 and Safety communication - Element 19.402

As with SMS documentation, training, education and safety communication are important ongoing activities throughout all phases of SMS implementation. As the SMS evolves, new processes, procedures or regulations may come into effect or existing procedures may change to cater for the SMS requirements. To ensure these changes are effectively understood and implemented by all personnel involved in safety related duties it is vital that training and communication remain as ongoing activities throughout and after the complete implementation of the SMS.

phase	SMS Elements to be implemented	Time
Phase 1	**1. SMS Element 19.101 (a):** (a) identify the accountable executive; (b) establish an SMS implementation team; (c) define the scope of the SMS; (d) perform an SMS gap analysis. **2. SMS Element 19.105 (a):** develop an SMS implementation plan. **3. SMS Element 19.103:** establish a key person/office responsible for the administration and maintenance of the SMS. **4. SMS Element 9.401 (a):** establish an SMS training programme for personnel, with priority for the SMS implementation team. **5. SMS Element 9.402 (a):** initiate SMS/safety communication channels.	Upon Application
Phase 2	**1. SMS Element 19.101 (a):** establish the safety policy and objectives, **2. SMS Element 19.102:** (a) define safety management responsibilities and accountabilities across relevant departments of the organization; (b) establish an SMS/safety coordination mechanism/ committee; (c) establish departmental/ divisional SAGs where applicable. **3. SMS Element 19.103:** establish an emergency response plan. **4. SMS Element 19.105 (b):** initiate progressive development of an SMS document/manual and other supporting documentation.	12 months

Phase 3

12 months

1. SMS Element 19.201 (a):

establish a voluntary hazard reporting procedure.

2. SMS Element 19.202:

establish safety risk management procedures.

3. SMS Element 19.301 (a):

(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 19.302:

establish a management of change procedure that includes safety risk assessment.

5. SMS Element 19.303:

(a) establish an internal quality audit programme;

(b) establish an external quality audit programme.

phase	SMS Elements to be implemented	Time
Phase 4	**1. SMS Element 19.101:** enhance the existing disciplinary procedure/ policy with due consideration of unintentional errors or mistakes from deliberate or gross violations. **2. SMS Element 19.201 (b):** (a) integrate hazards identified from occurrence investigation reports with the 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 19.301 (b):** (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 19.303:** (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 19.401 (b):** ensure that the SMS training programme for all relevant personnel has been completed. **6. SMS Element 19.402 (b):** promote safety information sharing and exchange internally and externally.	**12 months**

SMS Element 19.105: SMS documentation (Phases 1 to 4)

SMS Elements 19.401 and 19.402: SMS training, education and communication (Phases 1 and thereafter)

Note 1.— The implementation period indicated is an approximation. The actual implementation period is dependent on the scope of actions required for each element allocated and the size/complexity of the organization.

Appendix B - SMS Evaluation Tool

The objective of this appendix is to assist service providers and CARC's inspectors in determining how to best assess, develop and implement the various elements of an effective Safety Management System (SMS). This may be used during the initial SMS implementation and certification process, to help ensure that a service provider's SMS is scaled to a level that corresponds to the size of the service provider, the nature and complexity of the activities undertaken by the service provider, and the hazards and associated risks inherent in the activities undertaken by the service provider.

This guidance aims to assist in assessing the maturity and effectiveness of a service provider's SMS, it uses the concept of different levels of performance in respect to the service provider's safety management capability; these are described in the table below.

Present	There is evidence that the 'indicator' is clearly visible and is documented within the service provider's SMS Documentation.
Suitable	The indicator is suitable based on the size, nature, complexity of the service provider and the inherent risk in the activity, including consideration of the industry sector.
Operating	There is evidence that the indicator is in use and an output is being produced.
Effective	There is evidence that the indicator is effective and achieving the desired outcome.
Best Practice	service providers seeking to continually improve can use the best practice indicators to achieve a higher level of safety performance.

Figure 1 - Description of Individual Performance Indicators

The evaluation tool is designed to be able to be used at all stages of the SMS implementation process, from implementation planning through to certification. At certification, it may be used to establish whether the elements of an SMS are **Present** and **Suitable**. At a later stage the tool can also be used to assess how well the SMS is **Operating** and **Effective**. The **Best Practice** indicators are provided for service providers seeking opportunities to continually improve their overall safety performance and are not required for SMS certification (date for implementation). The tool requires an interactive approach within the service provider, e.g. discussions or interviews should be held with a cross section of people within the service provider, and processes and practices should be observed and analysed.

The tool is designed to recognize the difference in oversight methods such as traditional compliance-based oversight to performance-based oversight methods, thereby enabling the assessment of not only compliance but also the effectiveness of an SMS. The tool has also been designed to indicate the expected standard of an service provider's SMS in terms of acceptable means of compliance with the SMS related rules and advisory material, and the ability of the SMS to effectively manage safety risk. For ongoing surveillance activities the CARC may define additional expectations for individual indicators. As a part of the maturity assessment of the SMS, the CARC will determine if all individual indicators for each of the elements are operating, and that overall effectiveness has been achieved.

User Competencies

The Tool should be used by individuals with training and competency in:
- Safety Management Systems based on the ICAO SMS Framework
- Understanding of Quality Management Systems, compliance and auditing
- Interview techniques
- Understanding of risk management
- Appreciation of the difference between compliance and performance
- Report writing techniques, to allow narrative to be used to summarize the assessment.

Instructions for using the guidance

For each element an introductory paragraph adapted from ICAO Annex 19 SMS Framework is given, along with a reference to the associated JCAR Part 19 rule requirements. Following this there are a series of indicators for 'acceptable means of compliance + performance' and 'best practice' that should be reviewed to determine whether the indicator is Present, Suitable, Operating or Effective (P, S, O, E), using the guidance and descriptions set out below. The vertical P and S columns have been shaded out where there is unlikely to be an outcome for the particular indicator at SMS certification. The horizontal shaded performance indicators reflect the service provider's safety culture and have a corresponding letter 'C'.

How it is achieved

The service provider should use the 'How it is achieved' column to describe how they have achieved the P, S, O, or E level for the Acceptable Means of Compliance + Performance indicators citing any evidence or examples to support their assessment.

Verification

The Verification column may be used by the CARC to record any observations, conversations, records, manual reference and documents sampled.

How it is achieved to improve overall safety performance

Best practice indicators are provided for service providers seeking opportunities to continually improve their overall safety performance. Service providers can use the 'How it is achieved to improve overall safety performance' column to describe how they have achieved the P, S, O, or E level for the best practice indicators.

Service provider and CARC Summary

Once all indicators have been assessed by the service provider and the CARC, an assessment can be made on the overall effectiveness of the SMS element; this should be noted in the respective summary comments box.

The SMS Maturity

For most service providers, SMS will take time to implement and may take several years to mature to a level where it is fully effective. The following figure shows the different levels of SMS maturity within a service provider, as that service provider implements, develops and improves its SMS. The figure also illustrates how the tool is used to assess the

performance indicators (refer 'Description of Individual Performance Indicators', figure 1) in relation to the service provider's level of SMS maturity.
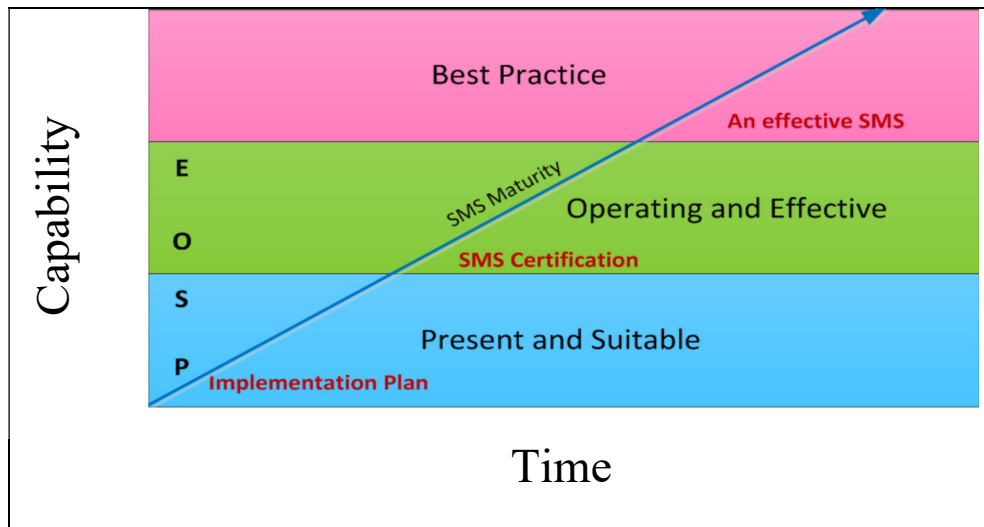

Figure 2 - SMS Maturity

0. SMS Implementation Plan

JCAR 19.105 (a) / ICAO Annex 19, Appendix 2 – 1.5.1

The service provider is required to develop an SMS implementation plan that outlines how the service provider will implement a system for safety management that meets the requirements of JCAR Part 19. The implementation plan should contain a sufficient level of detail to show that the service provider has adequately identified how it will meet the overall objective of successfully implementing an SMS.

	Acceptable Means of Compliance + Performance Indicators	P	S	O	E	How it is achieved	Verification
0.1	There is evidence that the implementation plan has been developed in consultation with the Accountable executive and individuals who are responsible for functions within the service provider.	☐	☐				
0.2	A gap analysis has been undertaken and the outcome documented, to compare the service provider's current state with the SMS rules and required elements.	☐	☐				
0.3	The tasks identified from the gap analysis, have been allocated the necessary resources to be completed.	☐	☐				
0.4	There is evidence that the completed gap analysis has been used to provide input for development of the implementation plan.	☐	☐				
0.5	The implementation plan may consist of more than one document, be combined with the gap analysis document, or created in a format that is appropriate to the content and complexity.	☐	☐				
0.6	There is evidence that a structured management of change process has been applied to the implementation of SMS.	☐	☐				
0.7	Management of change activities have been integrated into the implementation plan.	☐	☐				
0.8	The implementation plan includes realistic timelines and milestones for each task or group of tasks from the planning stage to the entire implementation of the SMS.	☐	☐				
0.9	For a phased implementation approach, these tasks are sorted according to the phase allocation of their related elements.	☐	☐				
0.10	Risks associated with the implementation of SMS have been	☐	☐				

0.11	identified and include appropriate control/mitigation. The coordination of integrating safety related third party contractors and suppliers without an SMS, into the scope of the service provider's SMS, are included in the implementation plan.	☐	☐
0.12	The implementation plan assigns responsibility for completion of the identified tasks and overall governance for the implementation plan.	☐	☐
0.13	A process is described whereby the status and performance of the SMS implementation plan is regularly monitored, and steps taken to mitigate substandard performance.	☐	☐

Effectiveness is achieved when the service provider can demonstrate that their SMS implementation plan addresses the required SMS elements and JCAR Part 19 requirements.

Service provider Summary   **CARC Summary**

_____   _____
_____   _____
_____   _____
_____   _____
_____   _____
_____   _____

Component 1 Safety Policy and Objective
JCAR 19.100 / ICAO Annex 19, Appendix 2 – 1.1, 1.2, 1.3, 1.4 & 1.5
For clarity, the Safety Policy and Accountability requirements have been separated under the following sub headings:
- o   - Management Commitment
- o   - Safety Accountability and Responsibilities
- o   - Appointment of Key Safety Personnel
- o   - Coordination of Emergency Response Planning
- o   - SMS Documentation

1.1 Management Commitment
The service provider is required to define its safety policy, which should be developed in consultation with management and staff representatives and be signed by the chief executive. The safety policy should reflect service provider commitments regarding safety, including a clear statement about the provision of the necessary human and financial resources for its implementation and be communicated, with visible endorsement, throughout the service provider. The safety policy should be regularly reviewed to ensure its remains relevant and appropriate to the service provider.

Acceptable Means of Compliance + Performance Indicators	P	S	O	E	How it is achieved	Verification
1.1.1 There is a safety policy endorsed by the Accountable executive that includes a commitment towards achieving the highest safety standards.	☐	☐	☐	☐		
1.1.2 The service provider has a safety management system that interfaces with other management system functions (e.g. workplace health & safety, quality, environmental, finance etc).	☐	☐	☐	☐		
1.1.3 The Accountable executive and the senior management team promote and demonstrate their commitment to the Safety Policy through active and visible participation in the system for safety management.	▓	▓	☐	☐		
1.1.4 The safety policy is communicated to all employees (including contract staff) with the intent that they are made aware of their individual responsibilities and obligations with regard to Safety.	☐	☐	☐	☐		
1.1.5 The safety policy includes a commitment to: • continuous improvement; • observing all applicable legal requirements, standards and best practice; • providing appropriate resources; • • defining safety as a primary responsibility of all staff.	☐	☐	☐	☐		
1.1.6C The safety policy actively encourages safety reporting.						
1.1.7 The safety policy is reviewed regularly to ensure it remains relevant and appropriate.	▓	▓	☐	☐		
1.1.8C A policy has been defined that clearly identifies the conditions under which punitive action would be considered (e.g. illegal activity, negligence or willful misconduct).						
1.1.9C There is evidence of decision making, actions and behaviours that reflect a positive safety culture.	▓	▓				

Best Practice Indicators (not required for SMS certification)	P	S	O	E	How it is achieved to improve overall safety performance
1.1.10 Personnel at all levels within the service provider are involved in the establishment and maintenance of the system for safety management.	☐	☐	☐	☐	
1.1.11 There is one safety policy used throughout the service provider and it is implemented at all levels of the service provider.	☐	☐	☐	☐	
1.1.12 The safety policy is clearly visible, or available, to all personnel (including significant contracted service providers) and is included in key documentation and communication media.	☐	☐	☐	☐	
1.1.13 Safety policy objectives drive the service provider's goals and mission statements.	☐	☐	☐	☐	
1.1.14 The service provider regularly verifies that personnel throughout the service provider are familiar with and have understood the policy and its message.			☐	☐	
1.1.15 The Accountable executive demonstrates their commitment by attending relevant industry safety conferences and forums.			☐	☐	
1.1.16C A non-punitive reporting policy is actively endorsed by management and staff representatives.					

Effectiveness is achieved when the service provider has defined its safety policy that clearly states its intentions, safety objectives and philosophies and there is visible evidence of safety leadership and management 'walking the talk' and demonstrating by example.

Service provider Summary   **CARC Summary**

_____   _____
_____   _____
_____   _____
_____   _____
_____   _____
_____   _____

1.2 Safety Accountability and Responsibilities

The chief executive will be identified as the person who, irrespective of other functions, shall have ultimate responsibility and accountability, on behalf of the service provider, for the implementation and maintenance of the SMS. The service provider shall also identify the safety accountabilities of all members of senior management, irrespective of other functions, as well as employees, with respect to the safety performance of the SMS. Safety responsibilities, accountabilities and authorities shall be documented and communicated throughout the service provider, and shall include a definition of the levels of management with authority to make decisions regarding safety risk tolerability.

	Acceptable Means of Compliance + Performance Indicators	P	S	O	E	How it is achieved	Verification
1.2.1	An Accountable executive has been appointed with full responsibility and ultimate accountability for the SMS to ensure it is properly implemented and performing effectively.	☐	☐	☐	☐		
1.2.2	The Accountable executive has control of the financial and human resources required for the implementation of an effective SMS.	☐	☐	☐	☐		
1.2.3	The Accountable executive is fully aware of their SMS roles and responsibilities in respect of the safety policy, safety standards and safety culture of the service provider.	☐	☐	☐	☐		
1.2.4	Safety accountabilities, authorities and responsibilities are defined and documented throughout the service provider.	☐	☐	☐	☐		
1.2.5	Staff at all levels, are aware of, and understand their safety accountabilities, authorities and responsibilities regarding all safety management processes, decisions and actions.	☐	☐	☐	☐		
1.2.6C	Safety management is shared across the service provider (i.e. it is not just the responsibility of the safety system manager and their team).						
1.2.7	There are documented management organizational diagrams and job descriptions for all personnel.	☐	☐	☐	☐		

Best Practice Indicators (not required for SMS certification)	P	S	O	E	How it is achieved to improve overall safety performance
1.2.8 There is evidence of employee involvement and consultation in the establishment and operation of the SMS.	☐	☐	☐	☐	
1.2.9C There is evidence that safety management system principles are active at all levels of the service provider and safety is part of the everyday language.					
1.2.10 Safety accountabilities throughout the service provider are clearly documented and individuals understand their accountabilities.	☐	☐	☐	☐	
1.2.11 Key safety activities are clearly described in senior management duties and responsibilities and are incorporated into their performance targets.	☐	☐	☐	☐	
1.2.12 Management recognizes positive safety behaviours and contributions to maintain the service provider's SMS.			☐	☐	

Effectiveness is achieved when there are clear lines of safety accountability throughout the service provider to the Accountable executive who has ultimate accountability for the SMS and the senior management team fully understand the risks faced by the service provider.

Service provider Summary   **CARC Summary**

_____   _____

_____   _____

_____   _____

_____   _____

_____   _____

1.3 Appointment of Key Safety Personnel

The service provider is required to identify a person who is responsible for the system for safety management, and who will be the focal point for the implementation and maintenance of an effective SMS. In addition, any safety group or committee that supports the Accountable executive and the safety manager in delivering an effective SMS should be defined and documented.

Acceptable Means of Compliance + Performance Indicators	P	S	O	E	How it is achieved	Verification
1.3.1 A competent person with the appropriate knowledge, skills and experience has been nominated as the person responsible for the system for	☐	☐	☐	☐		

safety management and fulfils the required job functions and responsibilities.

1.3.2   There is a demonstrable reporting line between the safety manager and the Accountable executive.   ☐ ☐ ☐ ☐

1.3.3   The service provider has allocated sufficient resources to manage the SMS including, but not limited to, safety investigation, analysis, auditing and promotion.   ☐ ☐ ☐ ☐

1.3.4   Individuals within the service provider that have a key safety role have their competence maintained through additional training and attendance at industry relevant conferences, seminars and workshops.   ☐ ☐

1.3.5   The service provider has established a structured safety group or committee, appropriate for the size and complexity of the service provider that is represented by a full range of employees.   ☐ ☐ ☐ ☐

Best Practice Indicators (not required for SMS certification)	P	S	O	E	How it is achieved to improve overall safety performance
1.3.6 The safety group or its equivalent monitors the safety performance of the operations and the effectiveness of the SMS.			☐	☐	
1.3.7 The senior person responsible for managing and maintaining the SMS is given appropriate status in the service provider, reflecting the importance of the safety role and is independent of line management.	☐	☐	☐	☐	
1.3.8 Safety group or equivalent includes stakeholders and significant contracted service providers.	☐	☐	☐	☐	
1.3.9 Safety group or equivalent is focused on safety issues and attendees are actively encouraged to participate.	☐	☐	☐	☐	

Effectiveness is achieved when the SMS is facilitated by the responsible individual and there is a safety structure of key personnel from the various operational areas of the organisation as appropriate. Senior management are actively engaged in the system for safety management.

Service provider Summary   **CARC Summary**

_____   _____

_____   _____

_____   _____

_____   _____

1.4 Coordination of Emergency Response Planning

service provider s engaged in aircraft operations require an emergency response plan that provides for the orderly and efficient transition from normal to emergency operations and the return to normal operations and is properly coordinated with the emergency response plans of those service provider s it must interface with during the provision of its service.

Acceptable Means of Compliance + Performance Indicators	P	S	O	E	How it is achieved	Verification
1.4.1 An emergency response plan (ERP) that reflects the size, nature and complexity of the operation has been developed and defines the procedures, roles, responsibilities and actions of the various service provider s and key personnel.	☐	☐	☐	☐		
1.4.2 Key personnel in an emergency have easy access to the ERP at all times.	☐	☐	☐	☐		
1.4.3 The organisation has a process to distribute the ERP procedures and to communicate the content to all personnel.	☐	☐	☐	☐		
1.4.4 The ERP is regularly tested for the adequacy of the plan and the results reviewed to improve its effectiveness.	▓	▓	☐	☐		

Best Practice Indicators (not required for SMS certification)	P	S	O	E	How it is achieved to improve overall safety performance	
1.4.5 The organisation has agreements with other service provider s for mutual aid and the provision of emergency services.	☐	☐	☐	☐		
1.4.6 The organisation has implemented a Critical Incident Stress Management programme for its staff.	☐	☐	☐	☐		

Effectiveness is achieved when the service provider has an emergency response plan that is appropriate and is regularly tested and updated including coordination with other service provider s as appropriate. .

Service provider Summary   **CARC Summary**

_____   _____

_____   _____

_____   _____

_____   _____

1.5 SMS Documentation

The service provider is required to develop and maintain SMS documentation. This should describe the safety policy and safety objectives, the SMS requirements, the SMS processes and procedures, the accountabilities, responsibilities and authorities for processes and procedures, and the SMS outputs. The organisation can incorporate the SMS documentation into its existing service provider documentation (exposition), or develop and maintain a stand-alone SMS manual to communicate its approach to the management of safety throughout the organisation.

Acceptable Means of Compliance + Performance Indicators		P	S	O	E	How it is achieved	Verification
1.5.1	There is documentation that describes the safety management system and the interrelationships between all of its elements.	☐	☐	☐	☐		
1.5.2	SMS documentation, including SMS related records, are regularly reviewed and updated with appropriate version control in place.			☐	☐		
1.5.3	Documented procedures are in place to establish and manage third party interfaces.			☐	☐		
1.5.4	The SMS documentation details and references the means for the storage of other SMS related records.	☐	☐	☐	☐		
1.5.5	SMS documentation is readily available to all personnel.	☐	☐	☐	☐		

Best Practice Indicators (not required for SMS certification)		P	S	O	E	How it is achieved to improve overall safety performance	
1.5.6	The service provider can demonstrate that safety management processes are integrated into other organisational systems.	☐	☐	☐	☐		
1.5.7	The service provider has analysed and uses the most appropriate means for the delivery of documentation at both the corporate and operational levels.	☐	☐	☐	☐		

Effectiveness is achieved when the service provider has SMS documentation that describes their approach to the management of safety, which is used throughout the organisation and is regularly reviewed and updated. The documentation supports the safety objectives of the organisation.

Service provider Summary   **CARC Summary**

_____   _____

_____   _____

_____   _____

_____   _____

Component 2 Risk Management
JCAR 19.200 / ICAO Annex 19, Appendix 2 – 2
2.1 Hazard Identification
The service provider is required to develop and maintain processes that ensure hazards to aviation safety are identified. Hazard identification should be based on a combination of reactive, proactive and predictive methods of safety data collection.

	Acceptable Means of Compliance + Performance Indicators	P	S	O	E	How it is achieved	Verification
2.1.1	The service provider has a reporting system to capture errors, hazards and near misses that is simple to use and accessible to all personnel and relevant third parties.	☐	☐	☐	☐		
2.1.2	The service provider has proactively identified relevant aviation safety hazards and assessed the associated risks related to its current activities.	☐	☐	☐	☐		
2.1.3	The safety reporting system provides feedback to the reporter of any actions taken (or not taken) and, where appropriate, to other personnel within the organisation or relevant third parties.	☐	☐	☐	☐		
2.1.4C	Personnel express confidence and trust in the service provider's reporting policy.			☐	☐		
2.1.5	Human performance related hazards are being identified.	☐	☐	☐	☐		

	Best Practice Indicators (not required for SMS certification)	P	S	O	E	How it is achieved to improve overall safety performance
2.1.6C	There is an active reporting system indicated by employee reporting levels being tracked as a safety performance indicator.					
2.1.7C	Safety Reports include the reporter's own errors and events (self-reporting) that the reporter would not normally report (events where no-one was watching).					

		P	S	O	E
2.1.8	The reporting system empowers personnel to propose preventative and corrective actions.	☐	☐	☐	☐
2.1.9C	The reporting system is actively used throughout the organisation.				
2.1.10	There is a process in place to analyse reports to look for trends and gain useable management information.	☐	☐	☐	☐

Effectiveness is achieved when hazards to aviation safety including near misses and errors are being identified and reported throughout the organisation. Hazards are captured in a register and assessed in a systematic and timely manner.

Service provider Summary   **CARC Summary**

_____   _____

_____   _____

_____   _____

_____   _____

2.2 Safety Risk Assessment and Mitigation

The service provider is required to develop and maintain processes for risk management that ensures analysis, assessment and control of safety risks.

	Acceptable Means of Compliance + Performance Indicators	P	S	O	E	How it is achieved	Verification
2.2.1	There is a structured process for the management of risk that includes the assessment of risk associated with identified aviation safety hazards.	☐	☐	☐	☐		
2.2.2	Potential safety risks associated with third party contractors and suppliers are assessed and mitigated.	☐	☐	☐	☐		
2.2.3	There are criteria for evaluating the level of risk the organisation is willing to accept and risk assessments and ratings are appropriately justified.	☐	☐	☐	☐		
2.2.4	The service provider has risk control processes that deliver effective and robust mitigations /controls, and where applicable an action plan.	☐	☐	☐	☐		
2.2.5	Mitigating / control actions resulting from the risk assessment, including timelines and allocation of responsibilities, are documented.	☐	☐	☐	☐		
2.2.6	Risk management is embedded in day to day activities and routinely applied in decision making processes.			☐	☐		

		P	S	O	E	
2.2.7	Senior management have visibility of medium and high risks and their mitigation and controls.	☐	☐	☐	☐	

Best Practice Indicators (not required for SMS certification)		P	S	O	E	**How it is achieved to improve overall safety performance**
5.8	There is evidence that risks are being managed to ALARP principles.			☐	☐	
5.9	The service provider uses its risks management results to develop best practice guidelines that it shares with the industry.			☐	☐	
5.10	The risk management processes are monitored and reviewed and improved on a periodic basis.			☐	☐	

Effectiveness is achieved when the organisation understands and is managing its safety risks through a defined process that ensures analysis, assessment and control to an acceptable level.

Service provider Summary   **CARC Summary**

_____   _____
_____   _____
_____   _____
_____   _____

2.3 Safety Investigation

The service provider is required to develop and maintain a process to conduct internal safety investigations in response to reported accidents, incidents and hazards for identifying causal factors to establish what went wrong, why, and how to prevent any recurrence.

	Acceptable Means of Compliance + Performance Indicators	P	S	O	E	**How it is achieved**	**Verification**
2.3.1	There is a structured process to ensure investigations are carried out to establish underlying contributing factors and potential hazards for existing and future operations.	☐	☐	☐	☐		
2.3.2	Personnel responsible for investigating safety reports are competent in investigation techniques.	☐	☐	☐	☐		
2.3.3	Safety reports are acted on in a timely manner.	☐	☐	☐	☐		
2.3.4	Investigations establish causal/contributing factors (why it happened, not just what happened).	☐	☐	☐	☐		
2.3.5	The actions resulting from investigation recommendations are	☐	☐	☐	☐		

recorded and monitored.

		P	S	O	E	How it is achieved to improve overall safety performance
2.3.6	The outcomes of safety investigations feed back into the service provider's SMS.			☐	☐	

Best Practice Indicators (not required for SMS certification)		P	S	O	E	How it is achieved to improve overall safety performance
2.3.7	The service provider applies systemic and thematic methodology when investigating incidents or accidents.			☐	☐	

Effectiveness is achieved when there are processes to trigger investigations, gathering evidence and conducting analysis, developing recommendations and for distributing the report. There is a documented record of the investigation process and required actions in response to safety investigations are monitored and reviewed.

Service provider Summary	**CARC Summary**
_____	_____
_____	_____
_____	_____
_____	_____

Component 3 Safety Assurance
JCAR 19.300 / ICAO Annex 19, Appendix 2 – 3
3.1 Performance Monitoring and Measurement

The service provider is required to develop and maintain the means to verify the safety performance of the service provider and to validate the effectiveness of safety risk controls. The safety performance of the service provider shall be verified in reference to the safety performance indicators and safety performance targets of the SMS.

	Acceptable Means of Compliance + Performance Indicators	P	S	O	E	How it is achieved	Verification
3.1.1	Safety goals and objectives have been established and communicated throughout the organisation.	☐	☐	☐	☐		
3.1.2	Safety performance targets and indicators have been defined, communicated and are being monitored and analysed for trends.	☐	☐	☐	☐		
3.1.3	Safety performance indicators correlate to the service provider's safety objectives.	☐	☐	☐	☐		
3.1.4	The service provider uses a combination of leading and lagging indicators to measure the safety performance of the organisation.	☐	☐	☐	☐		
3.1.5	Safety goals, objectives, targets and performance indicators are reviewed regularly to ensure they remain relevant and appropriate.			☐	☐		
3.1.6	Safety assurance activities feed back into the hazard identification and risk management process.			☐	☐		

3.1.7   The service provider is monitoring its current, future and third party safety risks and is taking action to address unacceptable safety risks.

Best Practice Indicators (not required for SMS certification)	**P**	**S**	**O**	**E**	**How it is achieved to improve overall safety performance**
3.1.8 When establishing and reviewing safety goals, objectives, targets and performance indicators, the service provider considers: hazards and risks; financial, operational and business requirements; view of interested parties.			☐	☐	
3.1.9 Safety goals, objectives, targets and performance indicators encompass all areas of the organisation.	☐	☐	☐	☐	
3.1.10 Performance measurements have been defined for significant safety risks identified by the service provider.	☐	☐	☐	☐	
3.1.11 Personnel at all levels are aware of the safety performance measurements in their areas of responsibility and the results of performance measurements are communicated to them.			☐	☐	
3.1.12 The analysis and allocation of resources is based on outputs from the performance measurement i.e. are intelligence led.			☐	☐	

Effectiveness is achieved when the service provider has developed a series of safety performance indicators that are appropriate to the type of operation. There is a means to measure and monitor trends and take appropriate action when necessary.

Service provider Summary   **CARC Summary**

_____   _____

_____   _____

_____   _____

_____   _____

3.2 Management of Change

The service provider is required to develop and maintain a process to identify changes within the organisation and its operation that may pose a risk to aviation safety. The process should describe the arrangements to ensure safety performance before implementing changes, and to eliminate or modify safety risk controls that are no longer needed or effective.

Acceptable Means of Compliance + Performance Indicators		P	S	O	E	How it is achieved	Verification
3.2.1	The service provider has established a process and conducts hazard analysis/risk assessment for significant operational changes, organisational changes and changes in key personnel.	☐	☐	☐	☐		
3.2.2	Risk assessments are aviation safety focused.	☐	☐	☐	☐		
3.2.3	Key stakeholders are involved in the management of change process.	☐	☐	☐	☐		
3.2.4	During the management of change process previous risk assessments and existing hazards are reviewed for possible effects.	☐	☐	☐	☐		
3.2.5	Management of change plans are documented and the outcomes are recorded.	☐	☐	☐	☐		
3.2.6	The management of change process is performed prior to the introduction of new equipment or processes that have safety implications.	☐	☐	☐	☐		

Best Practice Indicators (not required for SMS certification)		P	S	O	E	How it is achieved to improve overall safety performance
3.2.7	Validation of the safety performance occurs after organisational and operational changes have taken place to assure assumptions remain valid and the change was effective.	■	■	☐	☐	
3.2.8	Safety accountabilities, authorities and responsibilities are reviewed as part of the change.	☐	☐	☐	☐	

Effectiveness is achieved when the organisation uses the safety risk management system to proactively assess all significant changes to the service provider and its operations.

Service provider Summary　　　　　　　　　**CARC Summary**

3.3 Continuous Improvement of the SMS

The service provider is required to develop and maintain a process to identify opportunities to continuously improve its overall safety performance.

	Acceptable Means of Compliance + Performance Indicators	P	S	O	E	How it is achieved	Verification
3.3.1	The CEO (or persons accountable to the CEO) has the necessary authority to make decisions related to the improvement and effectiveness of the SMS.	☐	☐	☐	☐		
3.3.2	The SMS is regularly reviewed for improvements in safety performance and the outcome documented.			☐	☐		
3.3.3	A register of all safety related third party contractors and suppliers is kept and maintained.			☐	☐		
3.3.4	Safety related third party contractors and suppliers who do not have an SMS are included in the scope of the service provider's SMS.			☐	☐		
3.3.5	Contracts/service level agreements specifying safety standards are in place with safety related service providers.			☐	☐		
3.3.6	There is evidence of continuous improvement of the SMS.			☐	☐		
3.3.7	Evidence of lessons learnt is incorporated into policy and procedures.			☐	☐		

	Best Practice Indicators (not required for SMS certification)	P	S	O	E	How it is achieved to improve overall safety performance	
3.3.8	The organisation benchmarks its SMS against industry best practice and is an active promoter of SMS.			☐	☐		
3.3.9C	Best practice is sought and embraced.						
3.3.10C	Surveys and assessments of organisational culture are carried out at regular intervals and acted upon.						
3.3.11	For safety related services the service provider requires contracted organizations to have an SMS.	☐	☐	☐	☐		
3.3.12	For safety related services the SMS of the contracted organisation is interactive with that of the contracting organization.	☐	☐	☐	☐		

Effectiveness is achieved when the service provider routinely monitors the SMS performance to identify potential areas of improvement and the outcomes of this process lead to improvements to its overall safety performance.

Service provider Summary   **CARC Summary**

3.4 Internal Audit Program

The service provider is required to develop and maintain a process to conduct internal audits to assess compliance, conformance and system effectiveness.

Acceptable Means of Compliance + Performance Indicators		P	S	O	E	How it is achieved	Verification
3.4.1	There is a defined internal audit programme or plan that covers all of the service provider's operations over a specified period and extends to any third party service provider.	☐	☐	☐	☐		
3.4.2	Internal audits are being conducted to assess compliance, conformance and system effectiveness.	☐	☐	☐	☐		
3.4.3	Audits are performed by persons competent in auditing skills and techniques.	☐	☐	☐	☐		
3.4.4	Auditing personnel have operational independence of the area being audited.	☐	☐	☐	☐		
3.4.5	Analytical methods are used to identify the root causes of non-conformances or deviations to ensure actions are effective.	☐	☐	☐	☐		
3.4.6	There is a process for monitoring corrective and preventative actions resulting from audits to ensure required actions are appropriate, implemented in a timely manner, and effective.	☐	☐	☐	☐		
3.4.7	The operation of the internal audit programme is itself subjected to independent audit under the quality assurance programme.	☐	☐	☐	☐		

Best Practice Indicators (not required for SMS certification)		P	S	O	E	How it is achieved to improve overall safety performance
3.4.8	There is a planned, comprehensive internal audit process that is sufficiently flexible to accommodate a risk-based approach.	☐	☐	☐	☐	
3.4.9	Audit process not only audits against the documented standards, procedures	▓		☐	☐	

and practices, but also seeks to identify risk, or hazards and review existing controls for effectiveness.

Effectiveness is achieved when the service provider has a safety audit programme that is defined and fully implemented that examines compliance, conformance and system effectiveness.

Service provider Summary   **CARC Summary**

3.5 Management Review

The service provider is required to develop and maintain a process to ensure continuing effectiveness of the organisation's safety processes and procedures, and to assess opportunities for improvement.

	Acceptable Means of Compliance + Performance Indicators	P	S	O	E	How it is achieved	Verification
3.5.1	There is a documented and demonstrated method of conducting regular reviews by senior management of the effectiveness of the SMS.	☐	☐	☐	☐		
3.5.2	There is a documented process specifying the frequency of management reviews using a structured agenda.	☐	☐	☐	☐		
3.5.3	There is a process whereby the results of the review are evaluated and recorded, and conclusions implemented.	☐	☐	☐	☐		

	Best Practice Indicators (not required for SMS certification)	P	S	O	E	How it is achieved to improve overall safety performance
3.5.4	Taken into account are changes in risk exposure, stakeholders, business environment and performance.			☐	☐	

Effectiveness is achieved when senior management review the effectiveness of the safety management system (in terms of performance, policies and procedures, effectiveness in addressing safety related findings and achieving continuous safety improvement) and implement appropriate changes. .

Service provider Summary   **CARC Summary**

Component 4 Safety Promotion
JCAR 19.400 / ICAO Annex 19, Appendix 2 – 4
4.1 Training and Education
All personnel are trained and competent to fulfill their SMS related duties and the training programme is monitored for effectiveness and updated.

	Acceptable Means of Compliance + Performance Indicators	P	S	O	E	How it is achieved	Verification
4.1.1	There is a documented process to identify and provide Safety Management training, including initial and recurrent training, so that personnel are competent to fulfill their safety responsibilities.	☐	☐	☐	☐		
4.1.2	The training syllabus, eligibility and requirements are documented.	☐	☐	☐	☐		
4.1.3	The service provider's SMS training is part of the service provider's overall training programme.	☐	☐	☐	☐		
4.1.4	There is a process in place to measure the effectiveness of training and to take appropriate action to improve subsequent training.	☐	☐	☐	☐		
4.1.5	There is a process that evaluates the individual's competence that considers knowledge, skill and attitudes, and takes appropriate remedial action when necessary.	☐	☐	☐	☐		
4.1.6	A training record is maintained for all staff.	☐	☐	☐	☐		

	Best Practice Indicators (not required for SMS certification)	P	S	O	E	How it is achieved to improve overall safety performance
4.1.7C	Training includes human and organisational factors including just culture and non technical skills with the intent of reducing human error.					
4.1.8	Training requirements are documented for each area of activity within the organisation, including areas where training requirements are not defined by regulations.	☐	☐	☐	☐	
4.1.9	A training needs analysis is carried out for all staff and is regularly reviewed.	☐	☐	☐	☐	
4.1.10	SMS training is provided for third party contractors working in activities related to the company's operation.			☐	☐	

		P	S	O	E
4.1.11	Employees have a means to request additional SMS training in relation to their role in SMS.	☐	☐	☐	☐
4.1.12	Management recognize and uses informal opportunities to instruct employees on safety management.			☐	☐
4.1.13	SMS training includes attendance at industry forums and conferences.	☐	☐	☐	☐
4.1.14	SMS training exercises and methods for all employees are kept current to reflect such things as: o new techniques o technologies o results of investigations o corrective actions o regulatory changes			☐	☐
4.1.15	An annual training plan is in place.	☐	☐	☐	☐

Effectiveness is achieved when all personnel are trained and competent to perform their SMS related duties and the training programme is monitored for its effectiveness and updated.

Service provider Summary   **CARC Summary**

4.2 Safety Communication

The service provider should develop and maintain a process for safety communication that ensures all personnel are fully aware of the SMS, conveys safety critical information, and explains why particular safety actions are taken and why safety procedures are introduced or changed.

	Acceptable Means of Compliance + Performance Indicators	P	S	O	E	How it is achieved	Verification
4.2.1	Safety initiatives, strategies and information are communicated throughout the organisation to staff.	☐	☐	☐	☐		
4.2.2	Significant safety events and investigation outcomes are communicated to staff, including contracted organisations where appropriate.	☐	☐	☐	☐		
4.2.3	Internal and external sources of safety information are defined in SMS documentation.	☐	☐	☐	☐		

Best Practice Indicators (not required for SMS certification)	P	S	O	E	How it is achieved to improve overall safety performance
4.2.4 There is a safety communication plan that utilizes means such as: • electronic communication (emails, web-based presentations) • regular safety meetings • SMS newsletter etc.	☐	☐	☐	☐	
4.2.5 The effectiveness of safety communication is regularly assessed and the plan revised as required.			☐	☐	
4.2.6 Safety-related information is proactively shared with other organisations.			☐	☐	

Effectiveness is achieved when personnel are aware of the SMS, safety critical information and their role in respect of aviation safety.

Service provider Summary   **CARC Summary**

.

Appendix C - SMS Documentation

The SMS documentation shall include a top-level "SMS manual", which describes the service provider's SMS policies, processes and procedures to facilitate the organization's internal administration, communication and maintenance of the SMS. It shall help personnel to understand how the organization's SMS functions, and how the safety policy and objectives will be met. The documentation shall include a system description that provides the boundaries of the SMS. It shall also help clarify the relationship between the various policies, processes, procedures and practices, and define how these link to the service provider's safety policy and objectives. The documentation shall be adapted and written to address the day-to-day safety management activities that can be easily understood by personnel throughout the organization.

The SMS manual also serves as a primary safety communication tool between the service provider and key safety stakeholders (e.g. the CARC for the purpose of regulatory acceptance, assessment and subsequent monitoring of the SMS). The SMS manual may be a stand-alone document, or it may be integrated with other organizational documents (or documentation) maintained by the service provider. Where details of the organization's SMS processes are already addressed in existing documents, appropriate cross-referencing to such documents is enough. This SMS document will need to be kept up to date. As a controlled manual, CARC agreement is required before significant amendments are made.

The SMS manual shall include (as a minimum), a detailed description of the service provider's policies, processes and procedures including:

    a) safety policy and safety objectives;
    b) reference to any applicable regulatory SMS requirements;
    c) system description;
    d) safety accountabilities and key safety personnel;
    e) voluntary and mandatory safety reporting system processes and procedures;
    f) hazard identification and safety risk assessment processes and procedures;
    g) safety investigation procedures;
    h) procedures for establishing and monitoring safety performance indicators;
    i) SMS training processes and procedures and communication;
    j) safety communication processes and procedures;
    k) internal audit procedures;
    l) management of change procedures;
    m) SMS documentation management procedures; and
    n) where applicable, coordination of emergency response planning.

SMS documentation also includes the compilation and maintenance of operational records substantiating the existence and ongoing operation of the SMS. Operational records are the outputs of the SMS processes and procedures such as the SRM and safety assurance activities. SMS operational records shall be stored and kept in accordance with existing retention periods. Typical SMS operational records include:

    a) hazards register and hazard/safety reports;
    b) SPIs and related charts;
    c) record of completed safety risk assessments;
    d) SMS internal review or audit records;
    e) internal audit records;
    f) records of SMS/safety training records;
    g) SMS/safety committee meeting minutes;
    h) SMS implementation plan (during the initial implementation); and
    i) gap analysis to support implementation plan.

A distinction is to be made between an SMS manual and its operational supporting records and documents. The latter refers to historical and current records and documents generated during implementation and operation of the various SMS processes. These are documentary evidence of the ongoing SMS activities of the organization.

Appendix D - SMS Safety Performance Measurement

Tables APPD-1 to APPD-4 (safety indicator examples) provide illustrative examples of State aggregate safety performance indicators (SPIs) and their corresponding alert and target level setting criteria. The SMS SPIs are reflected on the right-hand side of the tables. The corresponding alert and target level criteria for each indicator are to be accounted for as shown. The SSP safety performance indicators on the left-hand side of the tables are shown to indicate the necessary correlation between the SMS and SSP safety indicators. SMS SPIs should be developed by product and service providers in consultation with their respective State regulatory organizations. Their proposed SPIs will need to be congruent with the State's SSP safety indicators; hence necessary agreement/acceptance should be obtained.

2. Table APPD-5 (example of an SMS safety performance indicator chart) is an example of what a high consequence SMS safety performance indicator chart looks like. In this case it is an airline operator's reportable/mandatory incident rate. The chart on the left is the preceding year's performance, while the chart on the right is the current year's ongoing data updates. The alert level setting is based on basic safety metrics standard deviation criteria. The Excel spreadsheet formula is "=STDEVP". For the purpose of manual standard deviation calculation, the formula is:

$$\sigma = \sqrt{\frac{\sum(x-\mu)^2}{N}}$$

where "X" is the value of each data point; "N" is the number of data points and "μ" is the average value of all the data points.

3. The target setting is a desired percentage improvement (in this case 5%) over the previous year's data point average. This chart is generated by the data sheet shown in Table APPD-6.

4. The data sheet in Table 5-A6-6 is used to generate the safety performance indicator chart shown in Table 5-A6-5. The same can be used to generate any other safety performance indicator with the appropriate data entry and safety performance indicator descriptor amendment.

5. Table APPD-7 (example of an SMS performance summary) provides a summary of all the operators' SMS safety indicators, with their respective alert and target level outcomes annotated. Such a summary may be compiled at the end of each monitoring period to provide an overview of the SMS performance. If a more quantitative performance summary

measurement is desired, appropriate points may be assigned to each Yes/No outcome for each target and alert outcome. Example:

High-consequence indicators:

Alert level not breached   [Yes (4), No (0)]
Target achieved   [Yes (3), No (0)]

Lower-consequence indicators:

Alert level not breached   [Yes (2), No (0)]
Target achieved   [Yes (1), No (0)]

This may allow a summary score (or percentage) to be obtained to indicate the overall SMS safety performance at the end of any given monitoring period.

Table APPD-1. Examples of safety performance indicators for air operators

SSP Safety Indicators (Aggregate State)						SMS Safety Performance Indicators (Individual Service Provider)					
High Consequence Indicators (Occurrence/ Outcome-based)			Lower Consequence Indicators (Event/ Activity-based)			High Consequence Indicators (Occurrence/ Outcome-based)			Lower Consequence Indicators (Event/ Activity-based)		
Safety Indicator	Alert level criteria	Target level criteria	Safety Indicator	Alert level criteria	Target level criteria	Safety Performance Indicator	Alert level criteria	Target level criteria	Safety Performance Indicator	Alert level criteria	Target level criteria
Air Operators (Air Operators of the State only)											
CAA aggregate Air Operators monthly serious incident rate (eg per 1000FH)	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.	CAA aggregate Air Operator annual surveillance Audit LEI% or findings rate (findings per audit)	Consideration	Consideration	Air Operator Individual Fleet monthly serious incident rate (eg per 1000FH)	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.	Operator Combined Fleet monthly Incident rate (eg per 1000FH)	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.
CAA aggregate Air Operators quarterly Engine IFSD incident rate (eg per 1000 FH)	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.	CAA aggregate Air Operator annual Line Station Inspection LEI% or findings rate (findings per inspection)	Consideration	Consideration	Air Operator Combined Fleet monthly serious incident rate (eg per 1000FH)	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.	Operator Internal QMS annual audit LEI% or findings rate (findings per audit)	Consideration	Consideration
			CAA annual Foreign Air Operators Ramp surveillance inspection Ave LEI% (for each Foreign Operator).	Consideration	Consideration	Air Operator Engine IFSD incident rate (eg per 1000 FH)	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.	Operator Voluntary Hazard reports rate [eg per 1000 FH]	Consideration	Consideration
			CAA aggregate Operators' DGR incident reports rate [eg per 1000 FH]	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.				Operator DGR incident reports rate [eg per 1000 FH]	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.

Table APPD-2. Examples of safety performance indicators for aerodrome operators

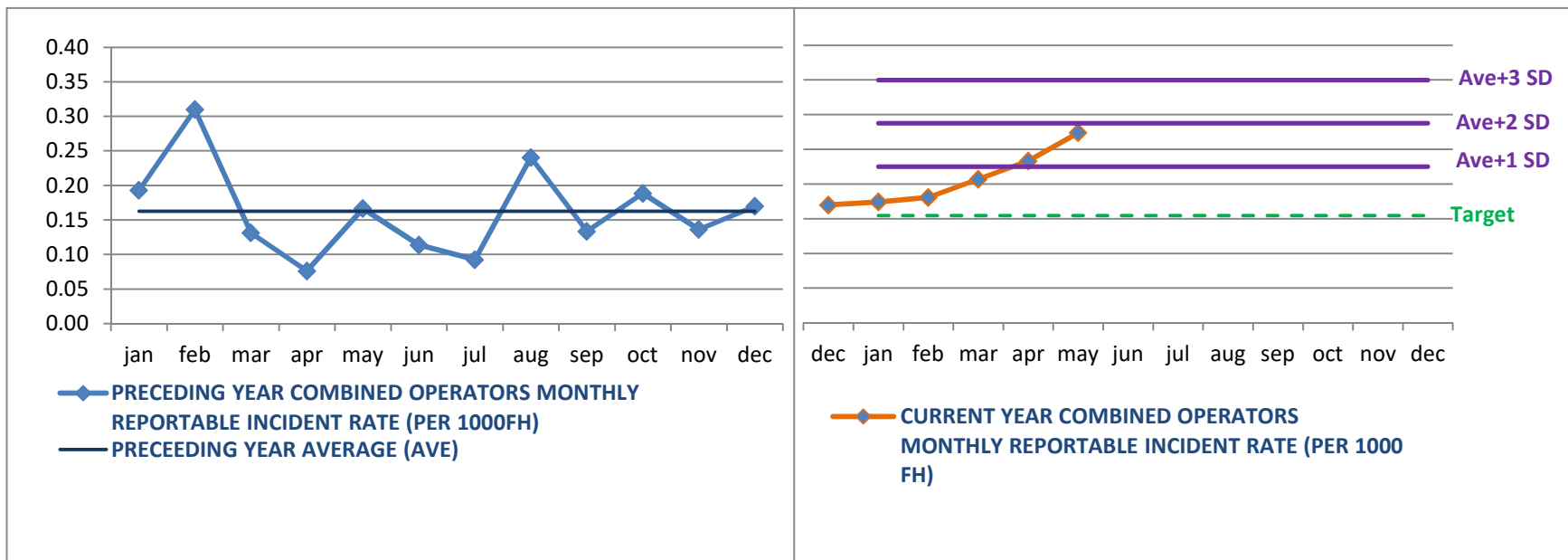| SSP Safety Indicators (Aggregate State)						SMS Safety Performance Indicators (Individual Service Provider)					
High Consequence Indicators (Occurrence/ Outcome-based)			Lower Consequence Indicators (Event/ Activity-based)			High Consequence Indicators (Occurrence/ Outcome-based)			Lower Consequence Indicators (Event/ Activity-based)		
Safety Indicator	Alert level criteria	Target level criteria	Safety Indicator	Alert level criteria	Target level criteria	Safety Performance Indicator	Alert level criteria	Target level criteria	Safety Performance Indicator	Alert level criteria	Target level criteria
Aerodrome Operators											
CAA aggregate aerodromes quarterly ground accident/ serious incidents rate - involving any aircraft [eg per 10,000 ground movements]	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.	CAA aggregate Aerodrome Operators annual surveillance Audit LEI% or findings rate (findings per audit)	Consideration	Consideration	Aerodrome Operator quarterly ground accident/ serious incident rate - involving any aircraft [eg per 10,000 ground movements]	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.	Aerodrome Operator Internal QMS annual audit LEI% or findings rate (findings per audit)	Consideration	Consideration
CAA aggregate aerodromes monthly/ quarterly Runway Excursion incidents rate - involving any aircraft [eg per 10,000 departures]	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.				Aerodromes Operator quarterly Runway Excursion incidents rate - involving any aircraft [eg per 10,000 departures]	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.	Aerodrome Operator quarterly Runway Foreign Object Report (FOR) rate [eg per 10,000 ground movements]	Consideration	Consideration
CAA aggregate aerodromes monthly/ quarterly Runway Incursion incidents rate - involving any aircraft [eg per 10,000 departures]	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.				Aerodromes Operator quarterly Runway Incursion incidents rate - involving any aircraft [eg per 10,000 departures]	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.	Operator Voluntary Hazard reports rate [per operational personnel per quarter]	Consideration	Consideration
									Aerodrome Operator quarterly aircraft ground Foreign Object Damage (FOD) incident report rate - involving damage to aircraft [eg per 10,000 ground movements]	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.
ETC											

Table APPD-3. Examples of safety performance indicators for ATS operators

SSP Safety Indicators (Aggregate State)						SMS Safety Performance Indicators (Individual Service Provider)					
High Consequence Indicators (Occurrence/ Outcome-based)			Lower Consequence Indicators (Event/ Activity-based)			High Consequence Indicators (Occurrence/ Outcome-based)			Lower Consequence Indicators (Event/ Activity-based)		
Safety Indicator	Alert level criteria	Safety Indicator	Alert level criteria	Safety Indicator	Alert level criteria	Safety Indicator	Alert level criteria	Safety Indicator	Alert level criteria	Safety Indicator	Alert level criteria
ATS Operators											
CAA aggregate ATS quarterly FIR (airspace) serious incidents rate - involving any aircraft [eg per 100,000 flight movements]	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.	CAA aggregate ATS quarterly FIR TCAS RA incidents rate - involving any aircraft [eg per 100,000 flight movements]	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.	ATS operator quarterly FIR serious incidents rate - involving any aircraft [eg per 100,000 flight movements]	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.	ATS Operator quarterly FIR TCAS RA incidents rate - involving any aircraft [eg per 100,000 flight movements]	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.
			CAA aggregate ATS quarterly FIR Level Bust (LOS) incident rate - involving any aircraft [eg per 100,000 flight movements]	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.	ATS operator quarterly/ annual near miss incident rate [eg per 100,000 flight movements]	Assume historical annual Ave rate is 3, possible Alert rate could be 5.	Assume historical annual Ave rate is 3, possible Target rate could be 2.	ATS Operator quarterly FIR Level Bust (LOS) incident rate - involving any aircraft [eg per 100,000 flight movements]	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.
			CAA aggregate ATS Operators annual surveillance Audit LEI% or findings rate (findings per audit)	Consideration	Consideration				ATS Operator Internal QMS annual audit LEI% or findings rate (findings per audit)	Consideration	Consideration
ETC											

Table APPD-4. Examples of safety performance indicators for maintenance, production and design organizations (DOA/POA/MRO)

SSP Safety Indicators (Aggregate State)						SMS Safety Performance Indicators (Individual Service Provider)					
High Consequence Indicators (Occurrence/ Outcome-based)			Lower Consequence Indicators (Event/ Activity-based)			High Consequence Indicators (Occurrence/ Outcome-based)			Lower Consequence Indicators (Event/ Activity-based)		
Safety Indicator	Alert level criteria	Target level criteria	Safety Indicator	Alert level criteria	Target level criteria	Safety Performance Indicator	Alert level criteria	Target level criteria	Safety Performance Indicator	Alert level criteria	Target level criteria
POA/ DOA/ MRO Organizations											
CAA aggregate MRO quarterly Mandatory Defect Reports (MDR) received	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.	CAA aggregate MRO/ POA/ DOA annual surveillance Audit LEI% or findings rate (findings per audit)	Consideration	Consideration	MRO/ POA quarterly rate of component technical warranty claims.	Ave + 1/2/3 SD. (annual or 2 yearly reset)	__% (eg 5%) improvement between each annual Mean Rate.	MRO/ POA/ DOA Internal QMS annual audit LEI% or findings rate (findings per audit).	Consideration	Consideration
CAA aggregate POA/ DOA quarterly rate of operational products which are subject of Airworthiness Directives (ADs) [per product line]	Consideration	Consideration				MRO/ POA quarterly rate of component Mandatory/ Major Defect Reports raised.	Consideration	Consideration	MRO/ POA/ DOA quarterly final inspection/ testing failure/ rejection rate	Consideration	Consideration
									MRO/ POA/ DOA Voluntary Hazard reports rate [per operational personnel per quarter]	Consideration	Consideration
ETC											

Table APPD-5. Example of an SMS safety performance indicator chart (with alert and target level settings)

A) **Alert Level** Setting:
Alert level for a new monitoring period (current year) is based on the preceding period's performance (preceding year), namely its data points Average & Std Deviation. The 3 alert lines are Ave+1SD, Ave+2SD and Ave+3SD

C) Target Level Setting(Planned Improvement) :
Target setting may be less structured than Alert level setting - eg target the new (current year) monitoring period's Ave rate to be say 5% lower (better) than the preceding period's Ave value.

B) **Alert Level** Trigger:
An Alert (abnormal/ unacceptable trend) is indicated if **ANY** of the conditions below are met for the current monitoring period (current year):
- Any single point is above 3 SD line
- 2 consecutive points are above 2 SD line
- 3 consecutive points are above 1 SD line
When an Alert is triggered (potential high risk or out of control situation), appropriate follow-up action is expected, such as further analysis to determine source and root cause of the abnormal incident rate and any necessary action to address the unacceptable trend .

D) Target Achievement:
At end of the current year, if the Ave rate for the current year is at least 5% or more lower than the preceding year's Ave rate, then the set Target of 5% improvement is deemed to have been achieved.

E) Alert & Target Levels - Validity Period:
Alert & Target levels should be reviewed/reset for each new monitoring period, based on the equivalent preceding period's Ave rate & SD, as applicable.

**Table APPD-6. Sample data sheet used to generate a high-consequence
SMS safety indicator chart (with alert and target setting criteria)**

Preceding Year					Current year				Current Year Alert Levels			Current Year Target (line)
Month	All Operators Total FH	All Operators Incidents	Incident Rate*	Ave (line)	Month	All Operators Total FH	All Operators Incidents	Incident Rate*	Preceding Year Ave +1SD (line)	Preceding Year Ave +2SD (line)	Preceding Year Ave +3SD (line)	
jan	51,837	10.00	0.19	0.16	dec	53006	9.00	0.17				
feb	48,406	15.00	0.31	0.16	jan	51635	9.00	0.17	0.23	0.29	0.35	0.15
mar	53,354	7.00	0.13	0.16	feb	44295	8	0.18	0.23	0.29	0.35	0.15
apr	52,513	4.00	0.08	0.16	mar	48323	10	0.21	0.23	0.29	0.35	0.15
may	54,037	9.00	0.17	0.16	apr	47176	11	0.23	0.23	0.29	0.35	0.15
jun	52,673	6.00	0.11	0.16	may	47469	13	0.27	0.23	0.29	0.35	0.15
jul	54,086	5.00	0.09	0.16	jun				0.23	0.29	0.35	0.15
aug	54,043	13.00	0.24	0.16	jul				0.23	0.29	0.35	0.15
sep	52,383	7.00	0.13	0.16	aug				0.23	0.29	0.35	0.15
oct	53,042	10.00	0.19	0.16	sep				0.23	0.29	0.35	0.15
nov	51,353	7.00	0.14	0.16	oct				0.23	0.29	0.35	0.15
dec	53,006	9.00	0.17	0.16	nov				0.23	0.29	0.35	0.15
		Ave	0.16		dec				0.23	0.29	0.35	0.15
		SD	0.06				**Ave**					
							SD					

* Rate Calculation:(per 1000 FH)

Ave+1SD	Ave+2SD	Ave+3SD
0.23	0.29	0.35

* Rate Calculation:(per 1000 FH)

Current Year Alert Level setting criteria is: Preceding Year Ave + 1/2/3 SD	
Current Year Target is say 5% Ave rate improvement over the Ave rate for the preceding year, which is:	**0.15**

**Table APPD-7. Example of Alpha Airline's SMS safety
performance measurement (say for the year 2018)**

	High-consequence safety performance indicator				
	SPI description	*SPI alert level criteria (for 2018)*	*Alert level breached (Yes/No)*	*SPI target level criteria (for 2018)*	*Target achieved (Yes/No)*
1	Alpha Airline's A320 fleet monthly serious incident rate (e.g. per 1 000 FH)	Average + 1/2/3 SD (annual or 2 yearly reset)	**Yes**	5% improvement of the 2018 average rate over the 2017 average rate	**No**
2	Alpha Airline's A320 fleet engine IFSD incident rate (e.g. per 1 000 FH)	Average + 1/2/3 SD (annual or 2 yearly reset	**Yes**	3% improvement of the 2018 average rate over the 2017 average rate	**Yes**
3	**etc**				

	Low-consequence safety performance indicator				
	SPI description	*SPI alert level criteria (for 2018)*	*Alert level breached (Yes/No)*	*SPI target level criteria (for 2018)*	*Target achieved (Yes/No)*
1	Operator combined fleet monthly incident rate (e.g. per 1 000 FH)	Average + 1/2/3 SD (annual or 2 yearly reset)	Yes	5% improvement of the 2018 average rate over the 2017 average rate	No
2	Operator internal QMS annual audit LEI % or findings rate (findings per audit)	More than 25% average LEI or any Level 1 finding or more than 5 Level 2 findings per audit	Yes	5% improvement of the 2018 average rate over the 2017 average rate	Yes
3	Operator voluntary hazard report rate (e.g. per 1 000 FH)	TBD		TBD	
4	Operator DGR incident report rate (e.g. per 1 000 FH)	Average + 1/2/3 SD (annual or 2 yearly reset)	Yes	5% improvement of the 2018 average rate over the 2017 average rate	Yes
5	**etc**				

Note 1.— Other process indicators. Apart from the above SMS level safety indicators, there may be other system

level indicators within each operational area of an organization. Examples would include process- or system-specific monitoring indicators in engineering, operations, QMS, etc., or indicators associated with performance-based programmes such as fatigue risk management or fuel management. Such process- or system-specific indicators should rightly be administered as part of the system or process concerned. They may be viewed as specific system or process level indicators which supplement the higher level safety performance indicators. They should be addressed within the respective system or process manuals/SOPs as appropriate. Nevertheless, the criteria for setting alert or target levels for such indicators should preferably be aligned with that of the SMS level safety performance indicators where applicable.

Note 2.— Selection of indicators and settings. The combination (or package) of high and lower-consequence safety indicators is to be selected by an organization according to the scope of the organization's system. For those indicators where the suggested alert or target level setting criteria is not applicable, the organization may consider alternate criteria as appropriate. General guidance is to set alerts and targets that take into consideration recent historical or current performance.