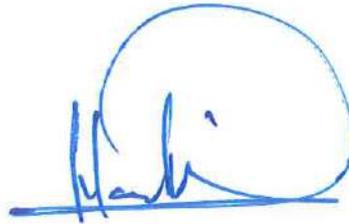


JCAR Part 19
Safety Management System

This part of the Jordanian Civil Aviation Regulation is hereby issued under the authority and provisions of article 12-B of the Jordanian Civil Aviation Law 41 of 2007, as amended.



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

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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
LEI	:	Level of Effective Implementation
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 Program
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 program, 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 analyzed 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 19.10 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 Program (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 OPS 1, Commercial Air Transportation (Aeroplanes);

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

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

JCAR Part 145, Approved Maintenance Organizations;

JCAR Part 139, 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 DDP, Unmanned Aircraft Design and Production.

Within the context of this part; no provision is intended to transfer to 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 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 Service providers' SMS

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 – 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

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 with this part provisions. In order to determine the

acceptability of the SMS, 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 program 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, CARC expects elements mentioned under Phase 1 to be provided at the time of application. Upon completion of the phases, 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 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. 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.

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 behaviors 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 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 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 shall establish and maintain an emergency response plan for aviation related emergencies, public health emergencies/pandemics and cases events 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 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 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.

Note 1 – The coordination of emergency response planning extends to providers of aviation products that may be attributable to, or affected by, an aviation safety occurrence. The product provider’s processes are generally called —contingency product support— and include emergency airworthiness action, alert services, and aircraft accident on-site support. The product provider need not change the name of these product support processes to ERP processes; however, they should be noted appropriately in the organization’s SMS documentation.

Note 2 – coordinated emergency procedures should be exercised as part of the periodic testing of the ERP.

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.

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 remedial 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 analyzed 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 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 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.

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 program that ensures that personnel are trained and competent to perform their SMS duties.
- (b) The service provider SMS training program 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 program 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 CARC's 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 applies 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 JCAR Part 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 the following methods:
 - (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 program/schedule for systematic review of all applicable aviation safety-related processes/equipment that are eligible for the risk management 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.

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

Training and education - Element 19.401 (b)

Complete an SMS training program 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

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

(b) 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.

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

Phase 3**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 program;

(b) establish an external quality audit program.

12 months

phase	SMS Elements to be implemented	Time
Phase 4	<p>1. SMS Element 19.101:</p> <p>enhance the existing disciplinary procedure/ policy with due consideration of unintentional errors or mistakes from deliberate or gross violations.</p> <p>2. SMS Element 19.201 (b):</p> <p>(a) integrate hazards identified from occurrence investigation reports with the voluntary hazard reporting system;</p> <p>(b) integrate hazard identification and risk management procedures with the subcontractor’s or customer’s SMS where applicable.</p> <p>3. SMS Element 19.301 (b):</p> <p>(a) enhance the safety data collection and processing system to include lower-consequence events;</p> <p>(b) develop lower-consequence SPIs and associated targets/alert settings.</p> <p>4. SMS Element 19.303:</p> <p>(a) establish SMS audit programs or integrate them into existing internal and external audit programs;</p> <p>(b) establish other operational SMS review/survey programs where appropriate.</p> <p>5. SMS Element 19.401 (b):</p> <p>ensure that the SMS training program for all relevant personnel has been completed.</p> <p>6. SMS Element 19.402 (b):</p> <p>promote safety information sharing and exchange internally and externally.</p>	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 – 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.