

PROPOSED CHANGES TO
APPENDIX 1
ADVISORY CIRCULAR 120-92A (DRAFT)
SAFETY MANAGEMENT SYSTEM (SMS) FRAMEWORK
for
AVIATION SERVICE PROVIDERS

(Formerly published as AC 120-92 Introduction to Safety Management Systems for Air Operators)

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Basis of the proposal

One of the key objectives of the Office of the Associate Administrator for Aviation Safety (AVS) and of the Flight Standards Service (AFS) is to produce a system of requirements, guidance, and tools that allow aviation service providers to develop and implement corporate-level safety management systems (SMSs) across multiple types of business and FAA certificates. AVS and AFS also seek to minimize the need for multiple management systems in companies that must, due to the nature of their businesses, interact with multiple regulatory authorities.

AVS and AFS have conducted and continue to conduct, extensive dialogue with our domestic industry constituents as well as with foreign authorities and businesses who have FAA-issued certificates and other authorizations. This proposed change to the functional requirements standards for aviation service providers reflects four key areas:

1. To provide aviation service providers in industry with a standardized set of concepts, documents, and tools for development and implementation of safety management systems;
2. To bring SMS standards for voluntary implementation of safety management systems into conformance with AVS policy in FAA Order VS 8000.367, appendix B;
3. To align the structure and format of Flight Standards documents and tools with the ICAO SMS frameworks, and;
4. To produce a set of documentation and tools that are internally mapped in a manner that is easier to use than the first generation of tools.

Except for changes in titles and a small number of changes to text which were necessitated to align with the requirements in FAA Order VS 8000.367 (these changes are highlighted in the text), the requirements in this document are unchanged from the original. However, they have been restructured to align with the structure of the ICAO Frameworks. Consequently, some text has been moved from the original placement. Work is ongoing to provide a table mapping the original locations to their places in the restructured document.

This document also includes the process performance objectives, which formerly only available in the Assessment Summary/Gap Analysis Tools and in the more detailed Design Assessment Tools (SAIs). This should facilitate easier use of the requirements without the need for cross-referencing.

Additionally, several passages that contained permissive language in the original document are marked for deletion. This information will be moved to the "Development Guidance" sections of the SMS Guidebooks.

It is envisioned that all assessment tools and the guidebooks will also be restructured so that a single component-element-process structure can be used throughout as well as between U.S., ICAO, and other governments' requirements documents that follow the ICAO structure.

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AVIATION SERVICE PROVIDER SAFETY MANAGEMENT SYSTEM (SMS) FRAMEWORK: FUNCTIONAL REQUIREMENTS

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AVIATION SERVICE PROVIDER SAFETY MANAGEMENT SYSTEM (SMS) FRAMEWORK: FUNCTIONAL REQUIREMENTS

Component 1. Policy

Performance Objectives: The expectations of this process is that—

- Each service provider organization will develop and implement an integrated, comprehensive, SMS for its entire organization.
- Each service provider organization will incorporate a procedure to identify and maintain compliance with current safety related, regulatory, and other requirements

General Requirements

A) Safety management shall be included in the complete scope and life cycle of the product/service provider's systems including:

- 1) For Air Operators:
 - a) flight operations;
 - b) dispatch/flight following;
 - c) maintenance and inspection;
 - d) cabin safety;
 - e) ground handling and servicing;
 - f) cargo handling; and
 - g) training.
- 2) For separate Aviation Maintenance Organizations:
 - a) Parts/Materials;
 - b) Resource Management (Tools & Equipment, Personnel, and Facilities);
 - c) Technical Data;
 - d) Maintenance and Inspection;
 - e) Quality Control;
 - f) Records Management;
 - g) Contract Maintenance;
 - h) Training

- B) SMS processes shall be:
 - 1) documented;
 - 2) monitored;
 - 3) measured; and
 - 4) analyzed.
- C) SMS outputs shall be:
 - 1) recorded;
 - 2) monitored;
 - 3) measured; and
 - 4) analyzed.
- D) The organization shall promote the growth of a positive safety culture (described under Component 4 under “General Requirements”).
- E) Top management shall ensure that the organization’s quality policy is consistent with the SMS.
- F) The SMS shall incorporate a means of compliance with legal and regulatory requirements.
- G) The organization shall establish and maintain a procedure to identify to current legal and regulatory requirements applicable to the SMS.
- H) The organization shall plan and maintain procedures with measurable criteria to accomplish the objectives of the safety policy¹.
- I) The organization shall establish and maintain supervisory and operational controls to ensure procedures are followed for safety-related operations and activities.

Element 1.1. Safety Policy

Performance Objective: Top Management will define the service provider’s safety policy and convey the expectations and objectives to its employees.

Requirements:

- A) Top management shall define the organization’s safety policy.
- B) The safety policy shall:
 - 1) include a commitment to implement an SMS;
 - 2) include a commitment to continual improvement in the level of safety;
 - 3) include a commitment to the management of safety risk;
 - 4) include a commitment to comply with applicable regulatory requirements;

¹ Measures are not expected for each procedural step. However, measures and criteria should be of sufficient depth and level of detail to ascertain and track accomplishment of objectives. Criteria and measures can be expressed in either quantitative or qualitative terms.

- 5) include a commitment to encourage employees to report safety issues without reprisal;
- 6) prescribe safety reporting procedures;
- 7) establish clear standards for acceptable behavior;
- 8) provide management guidance for setting safety objectives;
- 9) provide management guidance for reviewing safety objectives;
- 10) be documented;
- 11) be communicated with visible management endorsement to all employees and responsible parties;
- 12) be reviewed periodically to ensure it remains relevant and appropriate to the organization; and
- 13) identify responsibility of management and employees with respect to safety performance.

Element 1.2. Management Commitment and Safety Accountabilities

Performance Objective: Each service provider organization will define, document, and communicate the roles, responsibilities, and authorities regarding safety throughout its organization.

Requirements:

- A) Top management shall have the ultimate responsibility for the SMS.
- B) Top management shall provide resources essential to implement and maintain the SMS.
- C) Aviation safety-related positions, responsibilities, and authorities shall be:
 - 1) defined;
 - 2) documented; and
 - 3) communicated throughout the organization.
- D) ~~The organization~~ Top management shall define levels of management that can make safety risk acceptance decisions.

Element 1.3. Key Safety Personnel

Performance Objective: Each service provider organization will define, document, and communicate the roles, responsibilities, and authorities of key safety personnel.

Requirements:

- A) Top management shall appoint a member of management who, irrespective of other responsibilities, shall have responsibilities and authority that includes:

- (1) Ensuring that processes needed for the SMS are established, implemented and maintained
- (2) Reporting to top management on the performance of the SMS and the need for improvement , and
- (3) Ensuring the promotion of awareness of safety requirements throughout the organization.

Element 1.4. Emergency Preparedness and Response

Performance Objective: The expectation of this process is that the service provider will develop and implement procedures that it will follow in the event of an accident or incident to mitigate the effects of these events.

Requirements:

The organization shall establish procedures to:

- 1) identify the potential for accidents and incidents;
- 2) coordinate and plan the organization's response to accidents and incidents; and
- 3) execute periodic exercises of the organization's response.

Element 1.5. SMS Documentation and Records

Performance Objectives: The expectation of this process is that:

- the service provider will have clearly defined and documented safety policies, objectives, and procedures, and a document maintenance process that may be in paper or electronic format.
- The service provider will establish, implement, and maintain a safety management plan that meets the safety expectations and objectives.

Requirements:

- A) The organization shall establish and maintain information, in paper or electronic form, to describe:
 - 1) safety policies;
 - 2) safety objectives;
 - 3) SMS requirements;
 - 4) procedures and processes;
 - 5) responsibilities and authorities for procedures and processes;
 - 6) interaction between the procedures and processes; and
 - 7) SMS outputs.
- B) The organization shall establish and maintain a safety management plan to meet the safety objectives described in its safety policy.

C) Documentation Management

- 1) Documentation shall be:
 - a) legible;
 - b) dated (with dates of revisions);
 - c) readily identifiable;
 - d) maintained in an orderly manner; and
 - e) retained for a specified period as determined by the organization (and approved by the oversight organization).
- 2) The organization shall establish and maintain procedures for controlling all documents required by this Standard to ensure that:
 - a) they can be located;
 - b) they are periodically:
 - (1) reviewed,
 - (2) revised as necessary, and
 - (3) approved for adequacy by authorized personnel;
 - c) the current versions of relevant documents are available at all locations where operations essential to the effective functioning of the SMS are performed; and
 - d) obsolete documents are promptly removed from all points of use or otherwise assured against unintended use.

C) Records Management

- 1) For SMS records, the organization shall establish and maintain procedures for their:
 - a) identification;
 - b) maintenance; and
 - c) disposition.
- 2) SMS records shall be:
 - a) legible;
 - b) identifiable; and
 - c) traceable to the activity involved.
- 3) SMS records shall be maintained in such a way that they are:
 - a) readily retrievable; and
 - b) protected against:
 - (1) damage,
 - (2) deterioration, or
 - (3) loss.

- 4) Record retention times shall be documented.

Component 2. Safety Risk Management

Performance Objective: The organization will develop processes to understand the critical characteristics of its systems and operational environment and apply this knowledge to the identification of hazards, risk decision making, and the design of risk controls.

General Requirements

- A) SRM shall, at a minimum, include the following processes:
 - 1) system and task analysis;
 - 2) identify hazards;
 - 3) analyze safety risk;
 - 4) assess safety risk; and
 - 5) control safety risk.
- B) The SRM process shall be applied to:
 - 1) initial designs of systems, organizations, and/or products;
 - 2) the development of operational procedures;
 - 3) hazards that are identified in the safety assurance functions (described in Section Component 3); and
 - 4) planned changes to the operational processes to identify hazards associated with those changes.
- C) The organization shall establish feedback loops between assurance functions described in Section Component 3 to evaluate the effectiveness of safety risk controls.
- D) The Organization shall define a process for risk acceptance that:
 - 1) defines acceptable and unacceptable levels of safety risk (or safety risk objectives).
 - 2) establishes descriptions for:
 - a) severity levels, and
 - b) likelihood levels.
 - 3) The organization shall define levels of management that can make safety risk acceptance decisions.
 - 4) The organization shall define acceptable risk for hazards that will exist in the short-term while safety risk control/mitigation plans are developed and executed.

Element 2.1. Hazard Identification and Analysis

Process 2.1.1. System and Task Analysis

Performance Objective: The service provider will analyze its systems, operations, and operational environment to gain an understanding of critical design and performance factors, processes, and activities to identify hazards.

Requirements:

- A) System and task descriptions shall be developed to the level of detail necessary to:
- 1) identify hazards,
 - 2) develop operational procedures, and,
 - 3) develop and implement risk controls.
- B) ~~System and task analyses should consider the following:~~
- ~~1) the system's interactions with other systems in the air transportation system (e.g. airports, air traffic control);~~
 - ~~2) the system's functions for each area listed in Component 1, General Requirements, A) 1-7);~~
 - ~~3) employee tasks required to accomplish the functions in 2.1.1 B) 2);~~
 - ~~4) required human factors considerations of the system (e.g. cognitive, ergonomic, environmental, occupational health and safety) for:~~
 - ~~a) operations, and~~
 - ~~b) maintenance;~~
 - ~~5) hardware components of the system;~~
 - ~~6) software components of the system;~~
 - ~~7) related procedures that define guidance for the operation and use of the system;~~
 - ~~8) ambient environment;~~
 - ~~9) operational environment;~~
 - ~~10) maintenance environment;~~
 - ~~11) contracted and purchased products and services;~~
 - ~~12) the interactions between items in Section 2.1.1.B., 2-10 above; and~~
 - ~~13) any assumptions made about:~~
 - ~~a) the system,~~
 - ~~b) system interactions, and~~
 - ~~c) existing safety risk controls.~~

Process 2.1.2. Identify Hazards

Performance Objective: The expectation of this process is that a service provider will identify and document the hazards in its operations that are likely to cause death, serious physical harm or damage to equipment or property in sufficient detail to determine associated risk and determine acceptability.

Requirements:

- A) Hazards shall be:
 - 1) identified for the entire scope of the system, as defined in the system description²; and
 - 2) documented.
- B) Hazard information shall be:
 - 1) tracked, and
 - 2) managed through the entire SRM process.

Element 2.2. Risk Assessment and Control

Process 2.2.1. Analyze Safety Risk

Performance Objective: The service provider will determine and analyze the severity and likelihood of potential events associated with identified hazards and identify risk factors associated with unacceptable levels of severity or likelihood.

Requirements:

- A) The safety risk analysis process shall include:
 - 1) existing safety risk controls;
 - 2) triggering mechanisms; and;
 - 3) safety risk of reasonably likely outcomes from the existence of a hazard, to include estimation of the:
 - (1) likelihood; and
 - (2) severity.
 - (3) Risk likelihood and severity may be expressed in quantitative or qualitative terms.

Process 2.2.2 Assess Safety Risk

Performance Objective: The service provider will assess each identified hazard and define acceptance procedures and levels of management that can make safety risk acceptance decisions.

² While it is recognized that identification of every conceivable hazard is impractical, operators are expected to exercise due diligence in identifying and controlling significant and reasonably foreseeable hazards related to their operations.

Requirements:

- Each hazard shall be assessed for its safety risk acceptability using the safety risk objectives described in Section 1.1 B7 and Component 2, General Requirements, D).

Process 2.2.3. Control Safety Risk

Performance Objective: The expectation of this process is that the service provider will design and implement a risk control for each identified hazard for which there is an unacceptable risk to reduce the potential for death, serious physical harm, or damage to equipment or property to acceptable levels. For each Risk Control the residual or substitute risk will be analyzed before implementation.

Requirements:

- A) Safety control/mitigation plans shall be defined for each hazard with unacceptable risk.
- B) Safety risk controls shall be:
 - 1) clearly described;
 - 2) evaluated to ensure that the requirements have been met;
 - 3) ready to be used in the operational environment for which they are intended; and
 - 4) documented.
- C) Substitute risk shall be evaluated in the creation of safety risk controls/mitigations.

Component 3. Safety Assurance**Performance Objective (New):****General Requirements**

Performance Objective: The organization shall monitor, measure, and evaluate the performance and effectiveness of risk controls.

Requirements:

- A) The organization shall monitor their systems and operations to:
 - 1) identify new hazards;
 - 2) measure the effectiveness of safety risk controls; and
 - 3) ensure compliance with regulatory requirements.
 - 4) The safety assurance function shall be based upon a comprehensive system description as described in Section 2.1.1.
- B) The organization shall collect the data necessary to demonstrate the effectiveness of the organization's:
 - 1) Operational processes; and
 - 2) the SMS.

Element 3.1 Safety Performance Monitoring and Measurement

Process 3.1.1 Continuous Monitoring

Performance Objective: Monitor operational data, including products and services received from contractors, to identify hazards, measure the effectiveness of safety risk controls, and assess system performance.

Requirements:

- A) The organization shall monitor operational data (e.g., duty logs, crew reports, work cards, process sheets, and reports from the employee safety feedback system specified in Section 7.1.A)5) to:
 - 1) determine conformity with safety risk controls (described in Section Component 2);
 - 2) measure the effectiveness of safety risk controls (described in Section Component 2);
 - 3) assess system performance; and
 - 4) identify hazards.
- B) The organization shall monitor products and services received from subcontractors.

Process 3.1.2 Internal Audits by Operational Departments

Performance Objective: Perform regularly scheduled internal audits of operational processes, including those performed by contractors, to determine the performance and effectiveness of risk controls.

Requirements:

- A) Line management of operational departments shall ensure that regular internal audits of safety-related functions of the organization's operational processes (production system) are conducted. This obligation shall extend to any subcontractors that they may use to accomplish those functions.
- B) Line management shall ensure that regular audits are conducted to:
 - 1) determine conformity with safety risk controls; and
 - 2) assess performance of safety risk controls.
- C) Planning of the audit program shall take into account:
 - 1) safety criticality of the processes to be audited; and
 - 2) the results of previous audits.
- D) The audit program shall include:
 - 1) definition of the audit:
 - a) criteria,
 - b) scope,
 - c) frequency, and

- d) methods;
- 2) the processes used to select the auditors;
- 3) the requirement that auditors shall not audit their own work;
- 4) documented procedures, which include:
 - a) the responsibilities; and
 - b) requirements for:
 - (1) planning audits,
 - (2) conducting audits,
 - (3) reporting results, and
 - (4) maintaining records; and
- 5) audits of contractors and vendors.

Process 3.1.3 Internal Evaluation

Performance Objective: Conduct, at planned intervals, internal evaluations of the SMS and operational processes, to determine that the SMS conforms to its requirements.

Requirements:

- A) The organization shall conduct internal evaluations of the operational processes and the SMS at planned intervals to determine that the SMS conforms to requirements.
- B) Planning of the evaluation program shall take into account:
 - 1) safety criticality of processes to be audited; and
 - 2) the results of previous audits.
- C) The evaluation program shall include:
 - 1) definition of the evaluation:
 - a) criteria;
 - b) scope;
 - c) frequency; and
 - d) methods;
 - 2) the processes used to select the auditors;
 - 3) the requirement that auditors shall not audit their own work;
 - 4) documented procedures, which include:
 - a) the responsibilities, and
 - b) requirements for:
 - (1) planning audits,
 - (2) conducting audits,

- (3) reporting results,
 - (4) and maintaining records; and
 - 5) audits of contractors and vendors.
- D) The program shall be under the direction of the management official described in Section.
- E) The program shall include an evaluation of the program required described in Section.
- F) The person or organization performing evaluations of operational departments must be functionally independent of the department being evaluated.

Process 3.1.4 External Auditing of the SMS

Performance Objective: Include the results of audits performed by oversight organizations in its analysis of data.

Requirements:

- A) The organization shall include the results of oversight organization audits in the analyses conducted as described in Section 3.1.7.

Process 3.1.5 Investigation

Performance Objective: Establish procedures to collect data and investigate incidents, accidents and instances of potential regulatory non-compliance that occur to identify potential new hazards or failures of risk controls.

Requirements:

- A) The organization shall collect data on:
- 1) incidents, and
 - 2) accidents.
- B) The organization shall establish procedures to:
- 1) investigate accidents;
 - 2) investigate incidents; and
 - 3) investigate instances of regulatory non-compliance.

Process 3.1.6 Employee Reporting and Feedback System.

Performance Objective: Establish and maintain a confidential employee safety reporting and feedback system. Data obtained from this system will be monitored to identify emerging hazards and to assess performance of risk controls in the operational systems.

Requirements:

- A) The organization shall establish and maintain a confidential employee safety reporting and feedback system as in Section 7.1 A) 5).
- B) Employees shall be encouraged to use the safety reporting and feedback system without reprisal as in Section 4.2 B) 5).

- C) Data from the safety reporting and feedback system shall be monitored to identify emerging hazards.
- D) Data collected in the safety reporting and feedback system shall be included in analyses described in Section 6.4.

Process 3.1.7. Analysis of Data.

Performance Objective: The service provider will analyze the data described in Information Acquisition (6.3), to assess the performance and effectiveness of risk controls in the organization's operational processes and the SMS and to identify root causes of deficiencies and potential new hazards.

Requirements:

- A) The organization shall analyze data the data described in Section 3.1.1-3.1.6 to demonstrate the effectiveness of:
 - 1) risk controls in the organization's operational processes, and
 - 2) the SMS.
- B) Through data analysis, the organization shall evaluate where improvements can be made to the organization's:
 - 1) operational processes, and
 - 2) SMS.

Process 3.1.8. System Assessment.

Performance Objective: The service provider will perform an assessment of the performance and effectiveness of risk controls, and conformance with SMS requirements.

Requirements:

- A) The organization shall assess the performance of:
 - 1) safety-related functions of operational processes against their requirements, and
 - 2) the SMS against its requirements.
- B) System assessments shall result in a finding of:
 - 1) conformity with existing safety risk control(s)/ SMS requirement(s) (including regulatory requirements);
 - 2) nonconformity with existing safety risk control(s)/ SMS requirement(s) (including regulatory requirements); and
 - 3) new hazard(s) found.
- C) The SRM process will be utilized if the assessment indicates:
 - 1) the identification of new hazards; or
 - 2) the need for system changes.

- D) The organization shall maintain records of assessments in accordance with the requirements of Section 4.9.

Process 3.1.9. Preventive/Corrective Action.

Performance Objective: The organization takes action to eliminate nonconformances identified during analysis to prevent recurrence.

Requirements:

- A) The organization shall develop:
- 1) corrective actions for identified nonconformities with risk controls; and
 - 2) preventive for identified potential nonconformities with risk controls actions.
- B) Safety lessons learned shall be considered in the development of:
- 1) corrective actions; and
 - 2) preventive actions.
- C) The organization shall take necessary corrective action based on the findings of investigations.
- D) The organization shall prioritize and implement corrective action(s) in a timely manner.
- E) The organization shall prioritize and implement preventive action(s) in a timely manner.
- F) Records shall be kept of the disposition and status of corrective and preventive actions.

Process 3.1.10. Management Review.

Performance Objective: Top management will conduct regular reviews of the SMS including outputs of safety risk management, safety assurance, and lessons learned. Management reviews will include assessing the performance and effectiveness of an organizations operational processes and the need for changes.

Requirements:

- A) Top management will conduct regular reviews of the SMS, including:
- 1) the outputs of SRM (Section Component 2);
 - 2) the outputs of safety assurance (Section Component 3); and
 - 3) lessons learned (Section 7.5).
- B) Management reviews shall include assessing the need for changes to the organization's:
- 1) operational processes, and
 - 2) SMS.

Element 3.2 Management of Change

Performance Objective:

Requirements:

- A) The following shall not be implemented until the safety risk of each identified hazard is determined to be acceptable in:
- 1) new system designs;
 - 2) changes to existing system designs;
 - 3) new operations/procedures; and
 - 4) modified operations/procedures.
- B) The SRM process shall not preclude the organization from taking interim immediate action to mitigate existing safety risk.

Element 3.3 Continual Improvement

Performance Objective: The service provider will promote continuous improvement of its SMS by using safety lessons learned and communicating them to all personnel. The service provider will promote continuous improvement of its SMS by using safety lessons learned and communicating them to all personnel.

Requirements:

- A) The organization shall continuously improve the effectiveness of the SMS and of safety risk controls through the use of the safety and quality policies, objectives, audit and evaluation results, analysis of data, corrective and preventive actions, and management reviews.
- B) The organization shall develop safety lessons learned.
- 1) Lessons learned information shall be used to promote continuous improvement of safety.
 - 2) The organization shall communicate information on safety lessons learned.

Component 4. Safety Promotion

Performance Objective:

General Requirements

Top management shall promote the growth of a positive safety culture through:

- 1) publication of senior management's stated commitment to safety to all employees;
- 2) visible demonstration of their commitment to the SMS;
- 3) communication of the safety responsibilities for the organization's personnel;
- 4) clear and regular communication of safety policy, goals, objectives, standards, and performance to all employees of the organization

- 5) an effective employee safety feedback system that provides confidentiality as is necessary;
- 6) use of a safety information system that provides an accessible efficient means to retrieve information; and
- 7) allocation of resources essential to implement and maintain the SMS.

Element 4.1. Competencies and Training

4.1.1. Personnel Requirements (Competence)

Performance Objectives:

- The service provider will document competency requirements for those positions identified in 4.5.D and ensure those requirements are met; and
- The service provider will develop and document initial and recurrent training programs that are regularly evaluated.

Requirements:

- A) The organization shall document competency requirements for those positions identified in Section 1.3 C).
- B) The organization shall ensure that those individuals in the positions identified in 1.3.C) meet those competency requirements.

4.1.2. Training

Performance Objective: The service provider will develop and document initial and recurrent training programs that are regularly evaluated.

Requirements:

Training shall be developed for those individuals in the positions identified in 1.3 C).

- a) Training shall include:
 - (1) initial training; and
 - (2) recurrent training.
- b) Employees shall receive training commensurate with their:
 - (1) level; and
 - c) impact on the safety of the organization's product or service.
- 2) To ensure training currency, it shall be periodically:
 - a) reviewed; and
 - b) updated.

Element 4.2. Communication and Awareness

Performance Objective: Top Management will communicate the output of its SMS to its employees, and provide access to SMS outputs to its oversight organization in accordance with established agreements and disclosure programs.

Requirements:

- A) The organization shall communicate outputs of the SMS to its employees.
- B) The organization shall provide access to the outputs of the SMS to its oversight organization.

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