U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

Aviation Safety Policy

ORDER VS 8000.367

Effective Date:
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SUBJ: Aviation Safety (AVS) Safety Management System Requirements

This order fulfills the requirement described in FAA Order VS 8000.1, *Safety Management System (SMS) Doctrine,* Section 1-1.c.(2). Specifically, this document provides requirements to be met by AVS and AVS services/offices in support of the Aviation Safety Safety Management System (AVSSMS). This document does not define implementation schedules. Compliance with this order will be achieved in accordance with the implementation plans required by the *AVS SMS Doctrine* and as required by the *FAA Flight Plan.* The document addresses neither occupational safety and health nor personnel safety issues. This order addresses aviation safety.

In addition, each service/office plays a role in the AVSSMS. Therefore, AVS services/offices must have processes and procedures in place to ensure proper alignment with:

- SMS processes in other AVS services/offices;
- the AVSSMS; and
- SMS processes in product/service provider organizations for which the AVS service has oversight responsibility, if applicable.

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Chapter 1. General Information

1. Purpose of This Order. This order defines the requirements for the Safety Management System (SMS) in Aviation Safety (AVS).

2. Audience. All AVS personnel.

3. Where Can I Find This Order. You can find this order on the MyFAA Employee website: https://employees.faa.gov/tools_resources/orders_notices/

4. Scope. This order describes the functional requirements for the AVSSMS.

a. The requirements of this order apply to AVS and all AVS services/offices. In addition to implementation of the AVSSMS, each AVS service that has product/service provider organizations for which it has oversight responsibility, must publish SMS requirements specific to those organizations which it oversees (e.g., Flight Standards Service (AFS) must develop and publish requirements for SMSs in operator organizations, Aircraft Certification Service (AIR) must develop and publish SMS requirements for manufacturers, etc.). These requirements, which will be published by AVS services/offices, must be consistent with the requirements described in Appendix B of this Order. In addition, Appendix 1 in Advisory Circular (AC) 120-92, *Introduction to Safety Management Systems for Air Operators*, published by the General Aviation and Commercial Division (AFS-800), provides one example of requirements that are tailored to a particular segment of the air transportation system. SMSs are intended to be scaleable to match the type and criticality of the products and/or services they govern.

b. The AVS SMS consists of four main components: Safety Policy, Safety Risk Management, Safety Assurance, and Safety Promotion. These components are covered in more detail in the body of this Order. The components work together to enable AVS to manage the safety risk in the air transportation system. Safety Policy includes the statement of goals and objectives for AVS to fulfill, as well as staffing and planning. Safety Risk Management includes the forward looking identification of hazards in the air transportation system, analyzing and assessing their risk, and controls them (as required). Safety Assurance gathers data on the air transportation system, analyzes and assesses that data to determine if the safety risk controls generated in Safety Risk Management are effective, and if not, makes decisions regarding what appropriate corrective action should be taken. Finally, safety promotion includes communication, training, and the development of a positive safety culture.

c. AVS management has directed that all SMS related rulemaking activities be combined. This effort would encompass necessary rulemaking for the Flight Standards Service, the Aircraft Certification Service, and the Office of Aerospace Medicine.

d. The reader is encouraged to review Appendix A for definitions of terms used in this order.

Chapter 2. Policy

1. General Requirements.

a. The AVSSMS supplements the existing Code of Federal Regulations. [1] Together, they must be the basis for:

(1) Identifying hazards in the air transportation system and making or modifying safety risk controls, which are promulgated in the form of regulations, standards, orders, directives, policies, etc.;

(2) Specifying the regulatory basis for compliance with requirements;

(3) Specifying acceptable means of compliance with requirements;

(4) Issuing certificates and approvals;

(5) Providing safety assurance of the product/service provider organizations for which AVS has oversight responsibility;

(6) Requiring corrective action and, if necessary, taking enforcement actions; and

(7) Approving SMSs in product/service provider organizations for which AVS has oversight responsibility and overseeing their continual compliance with SMS requirements.

b. AVS must promote the growth of a positive safety culture.

2. Safety Policy.

a. Top management is responsible for the organization's safety policy and is responsible for safety performance of the organization.

b. The safety policy must include:

(1) A commitment to implement and maintain the AVSSMS;

(2) A commitment to continual improvement in the level of safety in the air transportation system;

(3) A commitment to the management of safety risk;

(4) A commitment to meet applicable statutory and regulatory requirements;

(5) An expectation that employees will report safety issues and where possible provide proposals for solutions/safety improvements;

(6) Clear standards for acceptable behavior;

[1] In cases where the AVSSMS and the Code of Federal Regulations are in conflict, the CFR takes precedence.

(7) Guidance for setting safety objectives;

(8) Guidance for reviewing safety objectives; and

(9) Responsibilities and accountabilities of management and employees with respect to AVSSMS and safety oversight responsibilities.

c. Safety policy must be:

(1) Documented;

(2) Communicated to all employees and responsible parties;

(3) Consistent with FAA and AVS goals and objectives; and

(4) Reviewed periodically to ensure it remains relevant and appropriate to the organization.

3. Quality Policy. Top management must ensure that the AVS quality policy is consistent with the AVSSMS.

4. Safety Planning.

a. AVS and AVS services/offices must develop and maintain plans to meet national and organizational safety objectives.

b. AVS must establish the acceptable level of safety for the entire air transportation system (excluding components outside AVS responsibility).

c. Within the constraints set by items 4a and 4b above, each AVS service/office must establish the acceptable level(s) of safety for:

(1) The organizations for which it has oversight responsibility; and

(2) The component(s) of the air transportation system it oversees.

5. Organizational Structure and Responsibilities.

a. Top management must have the ultimate responsibility for the AVSSMS.

b. Top management must provide resources essential to implement and maintain the AVSSMS.

c. Top management must appoint a management official to implement and maintain the AVSSMS.

d. Responsibilities for positions, duties, and authorizations to enable successful functioning of the AVSSMS must be:

(1) Defined;

(2) Documented; and

(3) Communicated throughout the organization.

6. Compliance with Statutory and Other Requirements.

a. The AVSSMS must incorporate a means of compliance with statutory and regulatory requirements applicable to the AVSSMS.

b. AVS must establish and maintain a procedure to identify the current statutory and regulatory requirements applicable to the AVSSMS.

7. Operational Procedures and Controls.

a. AVS must establish procedures with measurable criteria to accomplish its safety policy and objectives as defined by the AVSSMS. [2]

b. AVS must establish and maintain process controls to ensure procedures are followed for operations and activities as defined by the AVSSMS.

8. Emergency Preparedness and Response.

a. AVS must establish a plan to respond to accidents and serious incidents.

b. The effectiveness of the plan must be verified at intervals, either by response to real events or exercises.

[2] 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 the accomplishment of objectives. Criteria and measures can be expressed in either quantitative or qualitative terms.

Chapter 3. Safety Risk Management [3]

1. Safety Risk Management (SRM) must, at a minimum, include processes to:

a. Describe system;

b. Identify hazards;

c. Analyze safety risk;

d. Assess safety risk; and

e. Control/mitigate safety risk.

2. SRM must be applied in order to:

a. Determine the need for and develop safety risk controls to be applied to the component of the air transportation system or a specific product/service provider organization for which AVS has oversight responsibility;

b. Determine the level of involvement with approval/acceptance of product/service providers' SRM process outputs; [4]

c. Conduct independent safety risk analyses to validate selected product/service provider SMS outputs; and

d. Initiate changes to the AVSSMS.

3. AVS and AVS services/offices must define a process for risk acceptance.

a. AVS must define acceptable and unacceptable levels of safety risk. Descriptions must be established for severity levels and likelihood levels.

b. AVS and AVS services/offices must define levels of management that can make safety risk acceptance decisions.

c. AVS and AVS services/offices must define the level of safety risk that is acceptable in the short-term while long-term safety risk control/mitigation plans are developed and implemented.

4. The SRM process may allow AVS or AVS services/offices to take interim immediate action to mitigate existing safety risk.

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[3] In general, the extent and structure of safety risk assessment that is necessary will be greater when the item/issue to be assessed is more complex and effects of the hazards are more severe. The intent of the SRM process is to focus on the areas of greatest concern from a safety perspective taking into account safety risk, complexity, operational scope (impact to the air transportation system), etc.

[4] If the product/service provider does not have an SMS, the oversight organization still must use its SRM process to determine its level of involvement in the product/service provider's operations.

5. Establish Interface. AVS services/offices must establish interfaces between their SRM functions and:

a. Their safety assurance functions (described in Chapters 4 and 5) as necessary to evaluate the effectiveness of safety risk controls;

b. SRM and safety assurance functions in other AVS services/offices, as appropriate; and

c. AVS-level SRM and safety assurance functions.

6. Establish Criteria. AVS services/offices must establish the criteria for types of planned changes for which a product/service provider must receive approval from AVS prior to implementation in the operational system.

7. Describe System. The system description must be completed to the level necessary to identify hazards. [5]

8. Identify Hazards. Hazards must be identified within the system as described in Section 7.

9. Analyze Safety Risk. The safety risk analysis process must include analyses of:

a. Existing safety risk controls;

b. Contributing factors; and

c. The safety risk of reasonably likely outcomes from the existence of a hazard, to include estimation of the:

(1) Likelihood; and

(2) Severity. [6]

10. Assess Safety Risk. Each identified hazard must be assessed for its safety risk acceptability using the organization's acceptable and unacceptable levels of safety risk (as defined per requirements listed in Section 3).

11. Control/Mitigate Safety Risk.

a. Safety risk control/mitigation plans must be defined for hazards identified with unacceptable risk.

b. Substitute risk must be evaluated in the creation of safety risk controls/mitigations.

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[5] While it is recognized that identification of every conceivable hazard is impractical, organizations are expected to exercise diligence in identifying and controlling significant and reasonably foreseeable hazards related to their operations. Describing the system involves the act of bounding the system (i.e., defining what the system actually is). The definition process is a purely subjective one. Describing the system requires a definition of its boundary and its components.

[6] Severity and likelihood may be expressed in qualitative or quantitative terms. Generally, quantitative analysis is preferred.

c. The safety risk controls/mitigations must be evaluated to ensure that the safety requirements have been met.

d. Once safety risk control/mitigation plans are implemented, they must be monitored to ensure that safety risk controls have the desired effect.

Chapter 4. Safety Assurance Within AVS

The AVSSMS has a dual safety assurance focus, which consist of the AVS organization and product/service providers.

1. General Requirements.

a. AVS services/offices must establish interfaces with the safety assurance functions of other AVS services/offices and AVS-level safety assurance functions.

b. AVS services/offices must monitor their systems to:

(1) Identify new hazards;

(2) Measure the effectiveness of safety risk controls;

(3) Assess compliance with regulatory and statutory requirements applicable to the SMS; and

(4) Assess conformity with organizational safety policies and procedures.

c. AVS must allocate resources for internal safety assurance based on safety risk.

2. Information Acquisition.

a. AVS services/offices must collect the data/information necessary to demonstrate the effectiveness of the AVSSMS.

b. AVS services/offices must make available the data/information it collects with other AVS services/offices and AVS-level functions in the support of the AVSSMS.

3. Employee Reporting System.

a. AVS must establish and maintain an employee reporting system in which employees can report hazards, issues, concerns, occurrences, incidents, etc.

b. AVS employees must be encouraged to use the employee reporting system without reprisal (as described in Chapter 2, Section 2b(6).

4. Auditing and Evaluation within AVS.

a. AVS and AVS services/offices must conduct regular audits of their processes in accordance with the AVS QMS.

b. AVS must conduct its own evaluations of the AVSSMS in accordance with the AVS QMS to determine if the SMS conforms to requirements.

c. Audits and evaluations must be conducted with priority given to areas of highest safety risk.

5. Third Party Audits of the AVSSMS. If applicable, AVS must include the results of third party audits in the data/information analyses conducted as described in Section 6. [7]

6. Analysis of Data/Information. AVS must analyze the data/information described in Section 2 to demonstrate the effectiveness of the SMS.

7. System Assessment.

a. AVS must assess the performance of the SMS against its requirements.

b. System assessments must result in the documentation of:

(1) Conformity with existing SMS requirement(s);

(2) Nonconformity with SMS requirement(s); and

(3) Potential hazard(s) found.

c. The SRM process must be utilized if the assessment indicates:

(1) The identification of potential hazards; or

(2) The need for air transportation system changes.

8. Corrective Action. When nonconformities are identified, the AVS and AVS services/offices must prioritize and implement corrective actions.

9. Management Reviews.

a. Top management must conduct regular reviews of AVSSMS effectiveness.

b. Management reviews must include assessing the need for changes to the SMS.

[7] Audits could be conducted by the General Accountability Office (GAO), Department of Transportation Inspector General (IG), etc.

Chapter 5. AVS Safety Assurance of Product/Service Providers

1. General Requirements.

a. AVS services/offices must use the outputs of product/service provider's safety assurance functions.

b. AVS services/offices must allocate resources for product/service provider safety assurance with priority given to areas of highest safety risk.

2. Information Acquisition from the Air Transportation System.

a. AVS and AVS services/offices must monitor air transportation system data/information to:

(1) Assess conformity of their product/service providers with safety risk controls set by AVS, as well as those developed as a result of the product/service provider's SRM processes;

(2) Measure the effectiveness of existing AVS and product/service provider's safety risk controls;

(3) Identify the need for additional AVS and product/service provider's safety risk controls or changes to existing controls;

(4) Assess performance of the SMSs of their product/service providers (if applicable);

(5) Assess compliance with legal, regulatory and statutory requirements applicable to the SMS; and

(6) Identify new or potential hazards.

b. AVS services must conduct direct sampling of products and services of their product/service providers as necessary to meet the requirements in Section 2a.

3. Investigation.

a. AVS must establish criteria to investigate accidents and incidents.

b. AVS must establish procedures to:

(1) Investigate accidents;

(2) Investigate incidents; and

(3) Investigate instances of suspected non-compliance with regulations.

c. AVS services/offices must collect data/information on:

(1) Incidents; and

(2) Accidents.

4. Safety Assurance of Product/Service Provider Designs.

a. AVS services/offices must use outputs of their product/service provider organizations' SRM functions as inputs to their acceptance or approval of new and modified designs (e.g., product designs, organizational designs, new or modified operating practices, etc.) in accordance with criteria established in Chapter 3, Section 6.

b. AVS services/offices must assure that product/service provider's designs:

(1) Are in conformance with established requirements; and

(2) Include appropriate safety risk controls (as determined by the product/service providers SRM process).

c. If a submitted design is not in conformance with established requirements or does not include appropriate safety risk controls, the proposal must be sent back to the product/service provider for further analysis/study with an explanation of deficiencies.

d. AVS services/offices must employ their safety risk analysis function (which is the SRM process excluding the control/mitigate safety risk step described in Chapter 3, Section 11) when it determines that an independent analysis is necessary to validate the product/service provider's SRM process.

5. Safety Assurance of Product/Service Provider Performance.

a. AVS services/offices must use outputs from the product/service provider organizations' SMS as inputs to their assurance of the safety management performance of those organizations.

b. AVS services/offices must assure that product/service provider's performance is in accordance with the design that is accepted or approved (as described in Section 4a).

c. If an AVS service/office determines that a product/service provider's performance is not in accordance with the design that is accepted or approved (as described in Section 4a), it may require that the product/service provider take action or conduct further analysis/study.

d. AVS services/offices must employ their safety risk analysis function (which is the SRM process excluding the control/mitigate safety risk step described in Chapter 3, Section 11) when it determines that an independent analysis is necessary to validate the product/service provider's SRM process.

6. Auditing of Product/Service Providers' Product/Service (Sampling).

a. AVS services/offices must conduct audits of their product/service providers' products and services, as agreed with those organizations, to:

(1) Assess conformity with safety risk controls established by AVS; and

(2) Validate outputs of the product/service provider's SMS.

b. Audits must be conducted with priority given to areas of highest safety risk.

7. Analysis of Data/Information. AVS and AVS services/offices must analyze the data/information described in Section 2.

8. System Assessment.

a. AVS and AVS services/offices must assess the component(s) of the air transportation system for which AVS has oversight responsibility.

b. System assessments must result in the documentation of:

(1) Conformity with existing safety risk control(s)/SMS requirement(s) (including legal, regulatory and statutory requirements applicable to the SMS);

(2) Nonconformity with existing safety risk control(s)/SMS requirement(s) (including legal, regulatory and statutory requirements applicable to the SMS);

(3) Potentially ineffective control(s); and

(4) Potential hazard(s) found.

c. The SRM process must be utilized if the assessment indicates:

(1) The identification of new hazards; or

(2) The need for air transportation system changes.

Chapter 6. Safety Promotion

1. Safety Culture.

a. Top management must promote the growth of a positive safety culture in AVS through:

(1) Publication to all employees of senior management's stated commitment to safety;

(2) Communication of the safety responsibilities for the organization's personnel;

(3) Clear and regular communication of safety policy, goals, objectives, standards, and performance to all employees and stakeholders;

(4) An effective employee reporting system that provides confidentiality and de-identification as appropriate (as described in Chapter 4, Section 3);

(5) Use of a safety information system that provides an accessible efficient means to retrieve information; and

(6) Allocation of resources to implement and maintain the AVSSMS.

b. AVS and AVS services/offices promote the growth of a positive safety culture within those product/service provider organizations for which they have oversight responsibility.

2. Communication and Awareness.

a. AVS and AVS services/offices must communicate SMS outputs to their employees as appropriate.

b. AVS services/offices must communicate SMS outputs to AVS and other AVS services/offices as appropriate.

c. AVS services/offices must communicate SMS outputs to stakeholders as appropriate.

d. AVS and AVS services/offices must ensure that affected employees and stakeholders (including their product/service provider organizations, if applicable), are aware of the short-term safety risk of hazards that may exist in the air transportation system while safety risk controls are developed and implemented (as described in Chapter 3, Section 3c).

3. Personnel Competency.

a. AVS and AVS services/offices must document competency requirements for those positions identified in Chapter 2, Section 5d).

b. AVS and AVS services/offices must ensure that those individuals in the positions identified in Chapter 2, Section 5d) meet the documented competency requirements.

4. Safety Knowledge Management. The AVSSMS must include a process to capture knowledge of safety issues and incorporate it into the air transportation system.

5. Product/Service Provider SMS Requirements.

a. AVS services must develop, publish, and promulgate SMS requirements for the product/service provider organizations for which they have oversight responsibility, which are based on the four pillars (i.e., Safety Policy, SRM, Safety Assurance, and Safety Promotion) of safety management and are consistent with the requirements listed in Appendix B of this order. [8] AVS services may make their requirements more specific and/or develop additional requirements specific to the component of the air transportation system for which they oversight responsibility. Any more specific and additional requirements must be consistent with the minimum set of requirements contained in Appendix B.

b. AVS services must establish processes and procedures for acceptance or approval of product/service SMSs.

[8] Appendix 1 in Advisory Circular (AC) 120-92, Introduction to Safety Management Systems for Air Operators, published by the General Aviation and Commercial Division (AFS-800), provides an example of requirements that are tailored to a particular segment of the air transportation system.

Chapter 7. Interoperability

1. The AVSSMS must be able to interoperate with other FAA SMSs to manage cooperatively issues of mutual concern.

2. The AVSSMS must be able to interoperate with SMSs providers to the FAA to manage cooperatively issues of mutual concern.

3. AVS services/offices must create interfaces with SMS elements in other AVS services/offices as necessary to support the AVSSMS.

Chapter 8. Administrative Information

1. Distribution. This order is distributed to all AVS services and offices.

2. Background. Prior to embarking on SMS implementation, AVS implemented a quality management system (QMS) that meets the International Organization for Standardization (ISO) 9001:2000 standard. QMS principles govern all AVS activity and provide the foundation for the AVSSMS. Following the QMS structure ensures the AVSSMS will have documented, repeatable processes. The primary requirement for an SMS is to establish a management system that has the necessary processes and procedures in place such that safety is maintained at an acceptable level using safety management principles and the results are consistently achieved by employing quality management principles. Therefore, AVS services/offices will implement the AVSSMS on the principles of the QMS in place throughout AVS.

While all product/service providers in the air transportation system have a responsibility for safety management, it is not practical for all product/service providers to develop and operate SMSs.[9] Even though a product/service provider may not have a complete SMS, it still retains the responsibility to manage safety. In that event, a product/service provider can still benefit from implementing components of the SMS. AVS must still conduct oversight on entities that do not have an SMS. Given the advances in technology and processes, and the growth and development of the National Airspace System, it is anticipated that oversight will take on new forms.

To realize benefits of SMS at the air transportation system level, it is essential that functions within the services/offices that comprise the AVSSMS are appropriately integrated. Further, these functions must also be interrelated to SMS functions in product/service provider SMSs. There are requirements throughout the Order that address this relationship. In addition, Appendix C provides diagrams that illustrate the relationships within AVS and relationships between AVS and its product/service providers.

3. Related Publications. This Order has been developed to be consistent with the following documents:

a. FAA Order VS 8000.1, *Safety Management System Doctrine,* August 11, 2006

b. Annex 6 to the Convention on International Civil Aviation, *Operation of Aircraft*

c. Annex 11 to the Convention on International Civil Aviation, *Air Traffic Services*

d. International Civil Aviation Organization (ICAO) Document 9859, *ICAO Safety Management Manual*

e. ICAO Document 9734, *Safety Oversight Manual*

[9] An organization is generally considered to be an entity made up of more than one individual. One person operations would likely not implement an SMS and, therefore, the AVS service that provides oversight would not need to develop and publish SMS requirements for one person operations. For example, the Office of Aerospace Medicine (AAM) would likely not develop and publish SMS requirements for flight surgeons or individual airmen because they are individuals, rather than organizations.

f. American National Standard, Quality Management Systems – *Requirements* (Document Number: ANSI/ISO/ASQ 9001-2000)

g. American National Standard, Quality Management Systems – *Fundamentals and Vocabulary* (Document Number: ANSI/ISO/ASQ 9000-2000)

4. Authority to Change This Order. The Associate Administrator for Aviation Safety (AVS-1) has authority to issue changes and revisions to this order.

Appendix A: Definitions

As used in this document the following words or phrases are defined:

Accident – An occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage.

Air Transportation System – U.S. airspace, all manned and unmanned aircraft operating in that airspace, all U.S. aviation operators, airports, airfields, air navigation services, related infrastructure and all aviation-related industry.

Analysis – The process of identifying a question or issue to be addressed, examining the issue, investigating the results, interpreting the results and possibly making a recommendation. Analysis typically involves using scientific or mathematical methods for evaluation.

Assessment – Process of measuring or judging the value or level of something.

Audit – Formal reviews and verifications to evaluate conformity with policy, standards and contractual requirements.

Internal audit – An audit conducted by, or on behalf of, the organization being audited.

External audit – An audit conducted by an entity outside of the organization being audited.

Control – See safety risk control.

Corrective action – Action to eliminate or mitigate the cause or reduce the effects of a detected nonconformity or other undesirable situation.

Documentation – Information or meaningful data and its supporting medium (e.g., paper, electronic). In this context it is distinct from records because it is the written description of policies, processes, procedures, objectives, requirements, authorities, responsibilities, or work instructions.

Evaluation – A functionally independent review of organizational policies, procedures and systems. If accomplished by the organization itself, the evaluation should be done by an element of the organization other than the one performing the function being evaluated. The evaluation process builds on the concepts of auditing and inspection. An evaluation is an anticipatory process and is designed to identify and correct potential findings before they occur. An evaluation is synonymous with the term *systems audit*.

Functional requirements – A description of the intended behavior/action/performance of the system. In the context of this Standard, functional requirements allow the SMS developer to focus on intended behaviors/functions rather than implementing the exact steps as long as the organization's processes functionally correspond to the intent of the steps described in this Standard.

Hazard – Any existing or potential condition that can lead to injury, illness or death to people; damage to or loss of a system, equipment, or property; or damage to the environment. A hazard is a condition that is a prerequisite to an accident or incident.

Incident – An occurrence other than an accident that affects or could affect the safety of operations.

Interoperability – The ability for each SMS to be part of the system of systems through interdependent processes and/or components with shared principles, information and governance.

Likelihood – The estimated probability or frequency, in quantitative or qualitative terms, of a hazard's effect.

Line management – Management structure that operates the production/operational system.

Nonconformity – Non-fulfillment of a requirement. This includes but is not limited to non-compliance with Federal regulations. It also includes an organization's requirements, policies and procedures as well as requirements of safety risk controls developed by the organization.

Outputs – The result or product of an organization's productive processes (e.g., for a product/service provider an output would typically be a product or a service and for an oversight organization an output might be a rule, regulation, or requirement). *See also SMS output*

Oversight – A function that ensures the effective promulgation and implementation of the safety standards, requirements, regulations and associated procedures. Safety oversight also ensures that the acceptable level of safety risk is not exceeded in the air transportation system. Safety oversight in the context of the safety management system will be conducted via AVS's safety management system.

Procedure – A specified way to carry out an activity or a process.

Process – A set of interrelated or interacting activities that transforms inputs into outputs.

Product/service – Anything that might satisfy a want or need, which is offered in, or can be purchased in, and is part of the air transportation system. In this context, administrative or licensing fees paid to the government do not constitute a purchase.

Product/service provider – Any entity that offers or sells a product/service to satisfy a want or need in the air transportation system. In this context, administrative or licensing fees paid to the government do not constitute a purchase. Examples of product/service providers include: aircraft and aircraft parts manufacturers; aircraft operators; maintainers of aircraft, avionics, and air traffic control equipment; educators in the air transportation system; etc. (Note: any entity that is a direct consumer of air navigation services or operates in the U.S. airspace is included in this classification; examples include: general aviation, military aviation, and public use aircraft operators.)

Production/operational system – The functional productive system used by an organization to produce organizational outputs (e.g., product or service in the case of a product/service provider and rules, regulations, requirements, etc. in the case of an oversight organization).

Records – Evidence of results achieved or activities performed. In this context it is distinct from documentation because records are the documentation of SMS outputs.

Risk – See Safety risk. The terms *risk* and *safety risk* are used synonymously.

Safety – The state in which the risk of harm to persons or property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and risk management.

Safety assurance – SMS process management functions that systematically provide confidence that organizational outputs meet or exceed safety requirements.

Safety culture – The product of individual and group values, attitudes, competencies and patterns of behavior that determine the commitment to, and the style and proficiency of, the organization's management of safety. Organizations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety and by confidence in the efficacy of preventive measures.

Safety Management System (SMS) – The formal, top-down business-like approach to managing safety risk. It includes systematic procedures, practices, and policies for the management of safety (as described in this document it includes Safety Risk Management, safety policy, safety assurance, and safety promotion).

Product/Service Provider Safety Management System – The SMS owned and operated by a product/service provider.

Oversight Safety Management System – The SMS owned and operated by an oversight entity.

Safety objective – Safety goals or desired outcomes, which are typically measurable.

Safety requirement – A safety condition or capability that must be met or passed by a system to satisfy a contract, standard, specification or other formally imposed document or need.

Safety risk – The composite of predicted severity and likelihood of the potential effect of a hazard.

Safety risk control – A characteristic of a system that reduces safety risk. Controls may include process design, equipment modification, work procedures, training or protective device.

Safety Risk Management (SRM) – A formal process within the SMS composed of describing the system, identifying the hazards, assessing the risk, analyzing the risk, and controlling the risk. The SRM process is embedded in the processes used to provide the product/service; it is not a separate/distinct process.

Severity – The consequence or impact of a hazard in terms of degree of loss or harm.

Substitute risk – Risk unintentionally created as a consequence of safety risk control(s).

SMS output – The result or product of an SMS process. In this context, the result of a process, which is intended to meet a requirement described in this Standard (e.g., results of safety risk analyses, safety audits, and safety investigations)

System – An integrated set of constituent elements that are combined in an operational or support environment to accomplish a defined objective. These elements include people, hardware, software, firmware, information, procedures, facilities, services and other support facets.

Top management – The person or group of people that directs and controls an organization. Sometimes it is also referred to as senior management and may be the Chief Executive Officer, Board of Directors or Administrator.

Appendix B: Product/Service Provider SMS Requirements

The following requirements are the minimum set of requirements that must be established for constituent product/service provider organizations for which AVS services have oversight responsibility.

1. Scope and Applicability. To be developed by the AVS service/office.

2. References. To be developed by the AVS service/office.

3. Definitions. To be developed by the AVS service, but the definitions should be consistent with existing FAA definitions and those in the AVSSMS.

4. Policy.

a. General Requirements.

(1) Safety management must be included in the entire life cycle of the organization's outputs.

(2) The organization must promote the growth of a positive safety culture (described in Chapter 4, Section b and Chapter 7, Section a).

b. Safety Policy.

(1) Top management is responsible for the organization's safety policy and its safety performance.

(2) The safety policy must:

(a) include a commitment to implement and maintain the SMS;

(b) include a commitment to continual improvement in the level of safety;

(c) include a commitment to the management of safety risk;

(d) include a commitment to comply with applicable legal, regulatory and statutory requirements;

(e) include an expectation that employees will report safety issues and, where possible, provide proposals for solutions/safety improvements;

(f) establish clear standards for acceptable behavior;

(g) provide management guidance for setting safety objectives;

(h) provide management guidance for reviewing safety objectives;

(i) be communicated to all employees and responsible parties;

(j) be reviewed periodically to ensure it remains relevant and appropriate to the organization; and

(k) identify responsibility and accountability of management and employees with respect to safety performance.

c. Quality Policy. Top management must ensure that the organization's quality policy is consistent with the SMS.

d. Safety Planning. The organization must establish and maintain a safety management plan to meet the safety objectives described in its safety policy. [1]

e. Organizational Structure and Responsibilities.

(1) Top management must have the ultimate responsibility for the SMS.

(2) Top management must provide resources essential to implement and maintain the SMS.

(3) Top management must designate a management official to implement and maintain the SMS.

(4) Responsibilities for aviation safety positions, duties and authorizations must be:

(a) defined;

(b) documented; and

(c) communicated throughout the organization.

f. Compliance with Legal and Other Requirements.

(1) The SMS must incorporate a means of compliance with FAA policy, legal, regulatory and statutory requirements applicable to the SMS.

(2) The organization must establish and maintain a procedure to identify the current FAA policy, legal, regulatory and statutory requirements applicable to the SMS.

g. Operational Procedures and Controls.

(1) The organization must establish procedures with measurable criteria to accomplish its safety policy and objectives as defined by the SMS. [2]

(2) The organization must establish and maintain process controls to ensure procedures are followed for operations and activities as defined by the SMS.

h. Emergency Preparedness and Response.

(1) The organization must establish a plan for response to accidents and serious incidents.

(2) The effectiveness of the plan must be verified at intervals, either by response to real events or as an exercise.

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[1] Safety planning is a component of safety management that is focused on setting safety objectives and specifying necessary operational processes and related resource requirements to fulfill those objectives.

[2] 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 the accomplishment of objectives. Criteria and measures can be expressed in either quantitative or qualitative terms.

i. Safety Documentation and Records.

(1) The organization must establish and maintain information, in paper or electronic form, to describe:

(a) safety policies;

(b) safety objectives;

(c) SMS requirements;

(d) safety procedures and processes;

(e) responsibilities and authorities for safety procedures and processes; and

(f) interaction/interfaces between safety procedures and processes.

(2) The organization must document SMS outputs in records.

(3) The organization must maintain documents and records in accordance with document and record management policies specified by the oversight organization.

5. Safety Risk Management .[3]

a. SRM must, at a minimum, include the following processes:

(1) describe system;

(2) identify hazards;

(3) analyze safety risk;

(4) assess safety risk; and

(5) control/mitigate safety risk

b. The elements of the SRM process must be applied, either quantitatively or qualitatively, to:

(1) initial designs of systems, organizations, and products;

(2) the development of safety operational procedures;

(3) hazards that are identified in the safety assurance functions (described in Chapter 6); and

(4) planned changes to the production/operational system, including introduction of new products and procedures, to identify hazards associated with those changes.

c. The organization must establish feedback loops between assurance functions (described in Chapter 6) to evaluate the effectiveness of safety risk controls.

[3] In general, the extent and structure of safety risk assessment that is necessary will be greater when the item/issue to be assessed is more complex and effects of the hazards are more severe. The intent of the SRM process is to focus on the areas of greatest concern from a safety perspective, taking into account safety risk, complexity, operational scope (impact to the air transportation system), etc.

d. The organization must define a process for risk acceptance.

(1) The organization must define acceptable and unacceptable levels of safety risk. Descriptions must be established for severity levels and likelihood levels.

(2) The organization must define levels of management that can make safety risk acceptance decisions.

(3) The organization must define the level of safety risk that is acceptable in the short-term, while long-term safety risk control/mitigation plans are developed and implemented.

e. If applicable, the organization must establish procedures to obtain oversight organization approval for those planned changes that require oversight approval prior to implementation (in accordance with Chapter 4, Section f).

f. The safety risk of identified hazards must be deemed acceptable, prior to implementation of the following items in the production/operational system:

(1) new system designs;

(2) changes to existing system designs;

(3) new operations/procedures; and

(4) modified operations/procedures.

g. The SRM process may allow AVS or AVS services/offices to take interim immediate action to mitigate existing safety risk.

Figure B-1 illustrates the SRM process (described in this Chapter) and links it to safety assurance functions (described in Chapter 6). Note that this diagram is a functional depiction of the processes, not an organizational illustration. Therefore, these processes are not necessarily separate or distinct from the production/operational system; rather, the SRM process is embedded in the production/operational system. In addition, the process flow depicted can be entered at any point as circumstances require and it is not intended to suggest that the processes are necessarily linear. While the diagram and numbering system may imply that the functions are sequential; this is not necessarily the case.

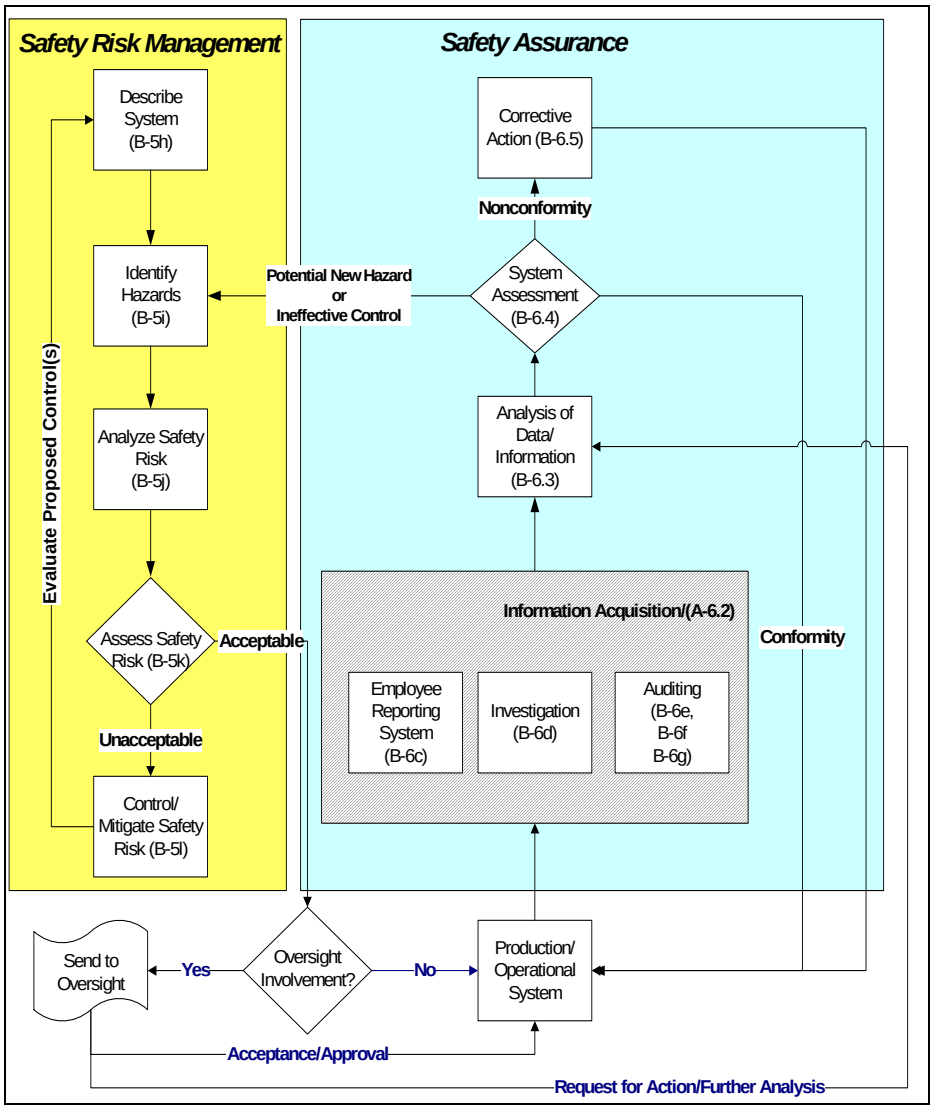

Figure B-1 – Safety Risk Management and Safety Assurance

h. Describe System. The system description must be completed to the level necessary to identify hazards. [4]

i. Identify Hazards. Hazards must be identified within the system as described in Section h.

j. Analyze Safety Risk. The safety risk analysis process must include analyses of:

(1) existing safety risk controls;

(2) contributing factors; and

(3) the safety risk of reasonably likely outcomes from the existence of a hazard, to include estimation of the:

(a) likelihood and

(b) severity. [5]

k. Assess Safety Risk. Each identified hazard must be assessed for its safety risk acceptability (as defined per requirements listed in Section d).

l. Control/Mitigate Safety Risk.

(1) Safety risk control/mitigation plans must be defined for hazards identified with unacceptable risk.

(2) Substitute risk must be evaluated in the creation of safety risk controls/mitigations.

(3) The safety risk control/mitigation must be evaluated to ensure that safety requirements have been met.

(4) Once safety risk control/mitigation plans are implemented, they must be monitored to ensure that safety risk controls have the desired effect.

6. Safety Assurance. Figure B-1 illustrates how Safety Assurance functions (described in Sections b-k) are linked to the SRM process (described in Chapter 5).

a. General Requirements. The organization must monitor its systems, operations and products/services to:

(1) Identify new hazards;

(2) Measure the effectiveness of safety risk controls;

(3) Assess compliance with legal, regulatory and statutory requirements applicable to the SMS; and

(4) Assess conformity with organizational safety policies and procedures.

b. Information Acquisition

[4] While it is recognized that identification of every conceivable hazard is impractical, organizations are expected to exercise diligence in identifying and controlling significant and reasonably foreseeable hazards related to their operations. Describing the system involves the act of bounding the system (i.e., defining what the system actually is). The definition process is a purely subjective one. Defining a system requires a definition of its boundary and its components.

[5] Severity and likelihood may be expressed in qualitative or quantitative terms.

(1) The organization must collect the data/information necessary to demonstrate the effectiveness of the SMS.

(2) The organization must monitor operational data/information.

(3) The organization must monitor products and services received from contractors.

c. Employee Reporting System

(1) The organization must establish and maintain an employee reporting system in which employees can report hazards, issues, concerns, occurrences, incidents, etc., as well as propose solutions/safety improvements

(2) Employees must be encouraged to use the employee reporting system without reprisal.[6]

d. Investigation [7]

(1) The organization must establish criteria for which accidents and incidents will be investigated.

(2) The organization must establish procedures to:

(a) investigate accidents;

(b) investigate incidents; and

(c) investigate instances of suspected non-compliance with safety regulations.

e. Auditing of the Production/Operational System

(1) The organization must ensure that regular audits of the production/operational system's safety functions are conducted with priority placed on the areas of highest safety risk. This obligation must extend to any contractors that the organization may use to accomplish those functions.[8]

(2) The organization must ensure that regular audits are conducted to:

(a) determine conformity with safety risk controls; and

(b) assess performance of safety risk controls.

(3) Auditing may be done at planned intervals or as a continuing process.

f. Evaluation of the SMS

(1) The organization must conduct evaluations of the SMS to determine if the SMS conforms to requirements.

(2) Evaluations may be done at planned intervals or as a continuing process.

g. Audits by Oversight Organization. If applicable, the organization must include the results of oversight organization audits in the data/information analyses conducted as described in Section h.

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[6] This does not restrict management from taking action in cases of gross negligence or willful operation outside the organization's safety requirements.

[7] It is understood that not all organizations have the ability to directly investigate accidents and incidents for relevance to their products/services (e.g., organizations that provide air traffic management systems or subsystems). Therefore, in this case the organization should use the results of investigations conducted by other entities.

[8] The organization can choose to conduct audits of its contractors or require that contractors conduct their own audits and provide the resultant data/information to the organization.

h. Analysis of Data/Information

The organization must analyze the data/information described in Section b.

i. System Assessment

(1) The organization must assess the performance of:

(a) the production/operational system's safety functions against its safety requirements as defined by the SMS and

(b) the SMS against its requirements.

(2) System assessments must result in the documentation of:

(a) conformity with existing safety risk control(s)/SMS requirement(s) (including legal, regulatory and statutory requirements applicable to the SMS);

(b) nonconformity with existing safety risk control(s)/SMS requirement(s) (including legal, regulatory and statutory requirements applicable to the SMS);

(c) potentially ineffective control(s); and

(d) potential hazard(s) found.

(3) The SRM process must be utilized if the assessment identifies:

(a) potential hazards or

(b) the need for production/operational system changes.

j. Corrective Action. When nonconformities are identified, the organization must prioritize and implement corrective actions.

k. Management Reviews.

(1) Top management must conduct regular reviews of SMS effectiveness.

(2) Management reviews must assess the need for changes to the SMS.

7. Safety Promotion.

a. Safety Culture. Top management must promote the growth of a positive safety culture demonstrated by, but not limited to:

(1) publication to all employees of senior management's stated commitment to safety;

(2) communication of safety responsibilities with the organization's personnel to make each employee part of the safety process;

(3) clear and regular communications of safety policy, goals, objectives, standards and performance to all employees of the organization;

(4) an effective employee reporting system that provides confidentiality and de-identification as appropriate (as described in Chapter 6, Section c);

(5) use of a safety information system that provides an accessible, efficient means to retrieve information; and

(6) allocation of resources to implement and maintain the SMS.

b. Communication and Awareness

(1) The organization must communicate SMS outputs to its employees as appropriate.

(2) If applicable, the organization must provide access to the SMS outputs to its oversight organization, in accordance with established agreements and disclosure programs.

(3) The organization must ensure that affected employees and external stakeholders (including its oversight organization, if applicable) are aware of the short-term safety risk of hazards that may exist in the production/operational system while safety risk control/mitigation plans are developed and implemented (as described in Chapter 5, Section d3).

c. Personnel Competency

(1) The organization must document competency requirements for those positions identified in Chapter 4, Section e4.

(2) The organization must ensure that individuals in the positions identified in Chapter 4, Section e4 meet the documented competency requirements.

d. Safety Knowledge Management. The SMS must include a process to capture knowledge of safety issues and incorporate it into future products, services and practices as appropriate.

8. Interoperability. The organization's SMS must be able to interoperate with other organizations' SMSs to manage cooperatively issues of mutual concern.

Appendix C - Safety Risk Management and Safety Assurance within SMS

Figure C-1 below illustrates the interactions and information flow between SMSs both with AVS (between the Organizational Level and the National Air Transportation System Level) and between the AVSSMS and a product/service provider SMS. Please note that the diagram depicts the high-level interaction between AVSSMS and one product/service provider SMS at the Organizational Level. This relationship is replicated many times over in the air transportation system. Figure C-2 on the next page provides a more detailed view of the interaction between Safety Risk Management and Safety Assurance functions across the system.

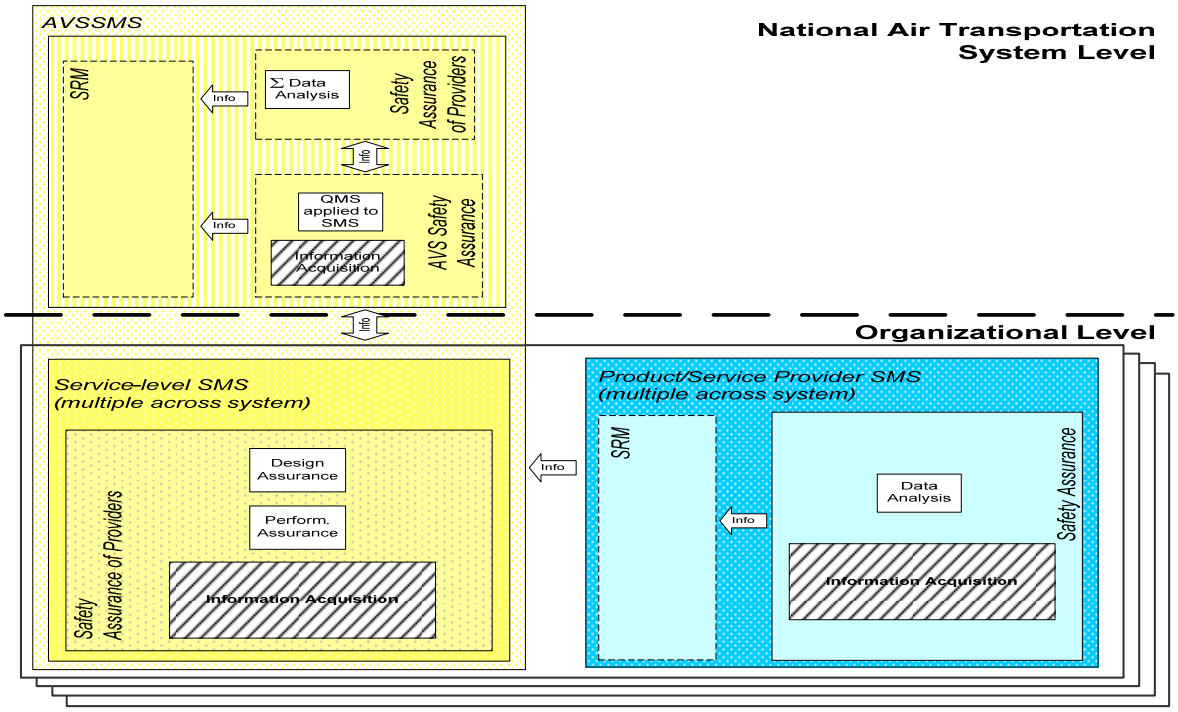

Figure C-1 – Safety Risk Management and Safety Assurance within SMS (High-level)

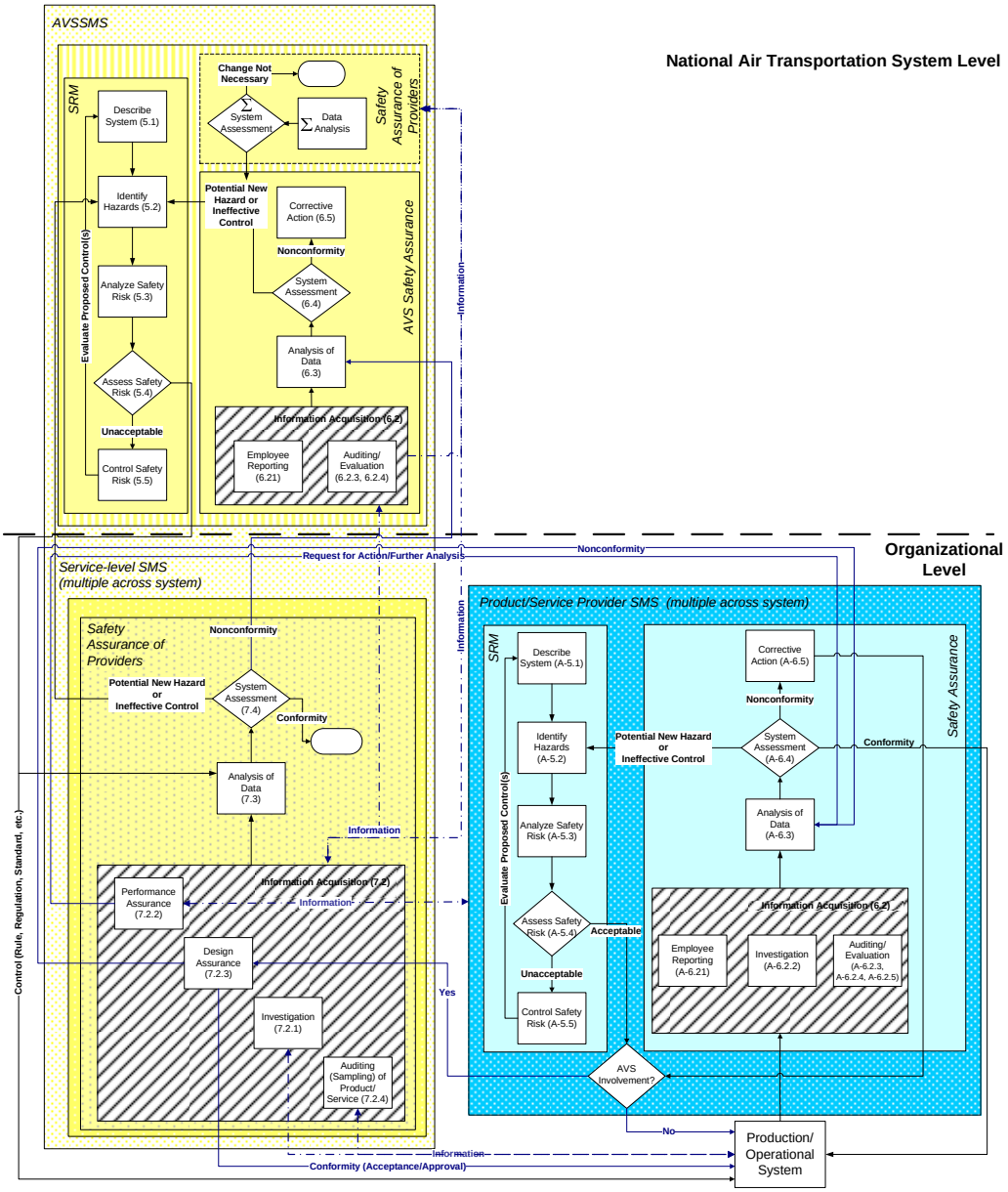

Figure C-2 – Safety Risk Management and Safety Assurance within SMS (Detailed)