

JPDO Paper

Safety Management System Standard v1.4

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The potential for significant growth and increased complexity in the air transportation system requires a fundamental change in the way the air transportation community manages safety. The safety programs of the future will evolve from reactive data analysis to a preventive approach that integrates historical and prognostic evaluation and management of hazards and their safety risk, to prevent future accidents and incidents.

Key to this critical evolution of safety programs is the establishment, by each organization responsible for a component of the air transportation system, of a Safety Management System (SMS) that encompasses systematic procedures, practices, and policies for the management of safety, including Safety Risk Management, safety policy, safety assurance, and safety promotion.

It is essential that these SMSs be integrated at the national level. This Standard describes the SMS requirements for the conduct of aviation operations and provision of aviation products/services by government agencies within the air transportation system. This Standard specifically applies to JPDO partner departments and agencies. These Federal organizations may develop more detailed SMS requirements to apply within their organization and to their constituent organizations, as long as they are consistent with the requirements contained in this Standard. For example, the Federal Aviation Administration (FAA) may promulgate SMS requirements for air carriers, aircraft manufacturers and all other stakeholders that it oversees. It is incumbent upon JPDO partner departments/agencies to work with their constituent organizations to accommodate tailored implementation for individual organizations.

The overarching goal of SMS implementation across the air transportation system is to ensure that the safety risk throughout the system is managed to an acceptable level. In addition, each individual SMS will ensure that the safety risk is acceptable in the portion of the air transportation system for which the organization is responsible. It will do so by providing a systematic approach to achieve the acceptable level of safety risk. SMS will also establish the mechanisms necessary to deliver and monitor safety performance.

Specifically, the SMS will require the organization to do the following:

- Establish lines of safety accountability throughout the organization, particularly at the senior/executive management level
- Set safety policy and lead SMS implementation at the top management level, flowing it down throughout the organization
- Identify and control safety risk related to its operations
- Apply principles of quality management to support management of safety
- Promote a strong safety culture

Many organizations in the air transportation system already have in place many important elements of an SMS. A complete SMS builds on existing processes and procedures, and introduces new capabilities as necessary to meet an SMS requirement. This Standard provides functional requirements for an SMS; the exact steps of an organization's processes may vary from the description herein as long as they are consistent with the requirements contained in this Standard. The SMS will have interfaces with other organizational systems, such as quality and information systems. Across the air transportation system, SMSs will be complementary and appropriately interfaced to ensure that the level of safety in the air transportation system is acceptable.

This Standard describes the minimal functional requirements to be used as the basis for an SMS in the air transportation system. It is applicable to the JPDO partner departments and agencies. These Federal organizations may develop more detailed SMS requirements to apply within its organization and to apply to its constituent organizations, if applicable.

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Preamble

The potential for significant growth and increased complexity in the air transportation system requires a fundamental change in the way the air transportation community manages safety. The safety programs of the future will continue to evolve from reactive data analysis to a preventive approach that integrates historical and prognostic evaluation and management of hazards and their safety risk, to prevent future accidents and incidents.

Key to this critical evolution of safety programs is the establishment, by each organization responsible for a component of the air transportation system, of a Safety Management System (SMS) that encompasses systematic procedures, practices, and policies for the management of safety, including Safety Risk Management (SRM), safety policy, safety assurance, and safety promotion.

It is essential that these SMS be integrated at the national level. This Standard describes the SMS requirements for the conduct of aviation operations and provision of aviation products/services by government agencies within the air transportation system. This Standard specifically applies to Joint Planning and Development Office (JPDO) partner departments and agencies. These Federal organizations may develop more detailed SMS requirements to apply within their organization and to their constituent organizations, as long as they are consistent with the requirements contained in this Standard. For example, the Federal Aviation Administration (FAA) may promulgate SMS requirements for air carriers, aircraft manufacturers and other stakeholders that it oversees. It is incumbent upon JPDO partner departments/agencies to work with their constituent organizations to accommodate tailored implementation for individual organizations. JPDO partner departments/agencies are also encouraged to work together to achieve commonality when developing SMS requirements that impact stakeholders involved with more than one Federal organization. For example, if the FAA and Department of Defense (DoD) SMS will both require component quality management processes for manufacturers, the two organizations should work (along with other involved Federal organizations) to develop harmonized requirements so impacted stakeholders only need to meet a single common requirement.

The overarching goal of SMS implementation across the air transportation system is to ensure that the safety risk throughout the system is managed to an acceptable level. In addition, each individual SMS will ensure that the safety risk is acceptable in the portion of the air transportation system for which the organization is responsible. It will do so by providing a systematic approach to achieve the acceptable level of safety risk. The SMS will also establish the mechanisms necessary to deliver and monitor safety performance. Specifically, the SMS will require the organization to do the following:

- Establish lines of safety accountability throughout the organization, particularly at the senior/executive management level
- Set safety policy and lead SMS implementation at the top management level, flowing it down throughout the organization
- Identify, analyze, assess, and control safety risk related to its operations

- Apply principles of quality management to support management of safety
- Promote a strong safety culture

Many Federal organizations in the air transportation system already have in place many important elements of an SMS. A complete SMS builds on existing processes and procedures and introduces new capabilities as necessary to meet an SMS requirement. This Standard provides functional requirements for an SMS; the exact steps of an organization's processes may vary from the description in this document as long as they are consistent with the requirements contained in this Standard. The SMS will have interfaces with other organizational systems, such as quality and information systems. Across the air transportation system, the SMS will be complementary and appropriately interfaced to ensure that the level of safety in the air transportation system is acceptable.

1. Scope and Applicability

- A) This Standard describes the minimal functional requirements to be used as the basis for an SMS in the air transportation system for Federal organizations. Specifically, it is applicable to the Joint Planning and Development Office (JPDO) partner departments and agencies. These Federal organizations may develop more detailed SMS requirements to apply within its organization. In addition, the JPDO partner departments/agencies should tailor these functional requirements when developing SMS requirements to apply to its constituent organizations, if applicable.
- B) Organizations are responsible for the safety of products and/or services contracted to, or purchased from, stakeholders (e.g., contractors and suppliers).

2. References

This Standard has been developed in consonance with the following documents:

- Next Generation Air Transportation System Integrated Plan
- Annex 6 to the Convention on International Civil Aviation, *Operation of Aircraft*
- Annex 11 to the Convention on International Civil Aviation, *Air Traffic Services*
- Annex 14 to the Convention on International Civil Aviation, *Aerodromes*
- International Civil Aviation Organization (ICAO) Document 9859, *ICAO Safety Management Manual*
- ICAO Document 9734, *Safety Oversight Manual*
- American National Standard, *Quality Management Systems – Requirements* (Document Number: ANSI/ISO/ASQ Q9001-2000)
- American National Standard, *Quality Management Systems – Fundamentals and Vocabulary* (Document Number: ANSI/ISO/ASQ Q9000-2000)

3. Definitions

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

Accident – An unplanned event or series of events that results in death, injury or damage to, or loss of, equipment or property.

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, and 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 – The process of measuring or judging the value or level of something.

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

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

Control – See safety risk control.

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

Documentation – The written description of policies, processes, procedures, objectives, requirements, authorities, responsibilities, or work instructions.

Evaluation – A review of organizational policies, procedures, and systems.

Functional requirements – A description of the intended behavior/action/performance of the system.

Hazard – Any existing or potential condition that can lead to injury, illness, or death of a person; 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 – A near miss episode, malfunction or failure without accident-level consequences that has a significant chance of resulting in accident-level consequences.

Interoperability – The ability for each SMS to share information and work with other SMS to manage safety risk.

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

Nonconformity – Non-fulfillment of a requirement.

Oversight – A function that ensures the effective promulgation and implementation of 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.

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.

Production/operational system – The functional, productive system used by an organization to produce organizational products/services.

Qualitative risk assessment – Relating to quality or kind; subjective approach to risk assessment.

Quantitative risk assessment – Expressed as a number or quantity; probabilistic or measured approach to risk assessment.

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.

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

Safety culture – The result 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 Standard, an SMS includes Safety Risk Management, safety policy, safety assurance, and safety promotion.

Safety objective – Desired safety outcomes, which are typically measurable.

Safety requirement – A safety condition or capability that must be met or surpassed 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 devices.

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 production/operational system; 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 created as a consequence of safety risk control(s).

SMS output – The result or product of an SMS process (e.g., results of: safety risk analyses, safety reviews, and safety investigations).

System – An integrated set of constituent elements that are combined 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, Secretary, Administrator, Commander, etc.

4. Policy

4.1. General Requirements

- A) Safety management shall be included in the entire life cycle of the organization's products/services.
- B) The organization shall promote the growth of a positive safety culture (described in Sections 4.2.B and 7.1).

4.2. Safety Policy

- A) Top management is responsible for the organization's safety policy and its safety performance.¹
- B) The organization's safety policy shall:
 - 1) include a commitment to implement and maintain the SMS;
 - 2) include a commitment to continual improvement of the SMS;
 - 3) include a commitment to the management of safety risk;
 - 4) include an expectation that employees will report safety issues and, where possible, provide proposals for solutions/safety improvements;
 - 5) establish standards for acceptable behavior that affects safety;
 - 6) document safety objectives;
 - 7) provide management guidance for reviewing safety objectives;
 - 8) be communicated to all appropriate employees;
 - 9) be reviewed periodically to ensure it remains relevant and appropriate to the organization; and
 - 10) identify responsibility and accountability of management and employees with respect to safety performance.

4.3. Quality System

If the organization has a quality system, it shall be consistent with the SMS.

¹ Policy can include orders, guidance material, or other internal documents that describe the organization's requirements and processes. These functional requirements can be accommodated through the existing documentation structure in the organization.

4.4. Safety Planning

The organization shall conduct and document safety management planning to meet the safety objectives described in its safety policy. 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.

4.5. Organizational Structure and Responsibilities

- 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) Top management shall designate a management official to implement and maintain the SMS.
- D) Responsibilities for executing aviation safety functions shall be:
 - 1) defined,
 - 2) documented, and
 - 3) communicated throughout the organization.

4.6. Compliance with Legal and Other Requirements

The SMS shall not be in conflict with legal, regulatory, and statutory requirements.

4.7. Operational Procedures and Controls

- A) The organization shall establish procedures with measurable criteria to accomplish its safety policy and objectives as defined by the SMS.²
- B) The organization shall establish and maintain process controls to ensure procedures are followed for operations and activities as defined by the SMS.

4.8. Emergency Preparedness and Response

- A) The organization shall establish a plan for response to accidents and serious incidents.
- B) The effectiveness of the plan shall be verified at established intervals, either by response to real events or as an exercise.

4.9. Safety Documentation and Records

- A) The organization shall establish and maintain information, in paper or electronic form, to describe:
 - 1) safety policies,
 - 2) safety objectives,
 - 3) SMS requirements,

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.

- 4) safety procedures and processes,
 - 5) responsibilities and authorities for safety procedures and processes, and
 - 6) interaction/interfaces between safety procedures and processes.
- B) The organization shall document SMS outputs in records.
- C) The organization shall maintain documents and records in accordance with the organization's document and record retention policies.

5. Safety Risk Management

5.1. General Requirements

- A) The organization shall use SRM to describe the system, identify hazards, analyze and assess the risk of those hazards, and mitigate the risk to an acceptable level.³
- B) The elements of the SRM process shall be applied, either quantitatively or qualitatively, to:
- 1) the development of operational procedures;⁴ and
 - 2) hazards that are identified in the safety assurance functions, which are described in Section 6.
- C) The organization shall have a means to identify and control hazards introduced by planned changes to the production/operational system.
- D) The organization shall establish an interface between safety risk management and safety assurance (described in Section 6) to evaluate the effectiveness of safety risk controls.
- E) The organization shall define a process for the acceptance of risk, if risk acceptance is within the organization's responsibility.
- 1) The organization must define acceptable levels of safety risk. Descriptions must be established for severity and likelihood levels.⁵
 - 2) The organization must define who 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.
- F) Where applicable, the organization shall establish criteria for the types of planned changes to the production/operational system that need oversight involvement prior to implementation.

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 or 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 It should be recognized that there are some procedures that do not lend themselves to the application of SRM. For instance, the prediction and probability of human error under extremely rare circumstances.

⁵ See Appendix B for more information on establishing acceptable levels of safety risk. Note that the definitions for acceptable levels of risk must be satisfactory to the requisite oversight organization, if applicable.

- G) The safety risk of identified hazards shall 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.
- H) The SRM process may allow the organization to take interim immediate action to mitigate existing safety risk.
- I) The SRM process may consider the trade-off between safety risk and other types of organizational risk (e.g., financial, mission, regulatory), as appropriate.⁶

Figure 1 illustrates the SRM process (described in Section 5) and links it to safety assurance functions (described in Section 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.

⁶ Some organizations may have mission objectives that must be considered in addition to acceptability of safety risk.

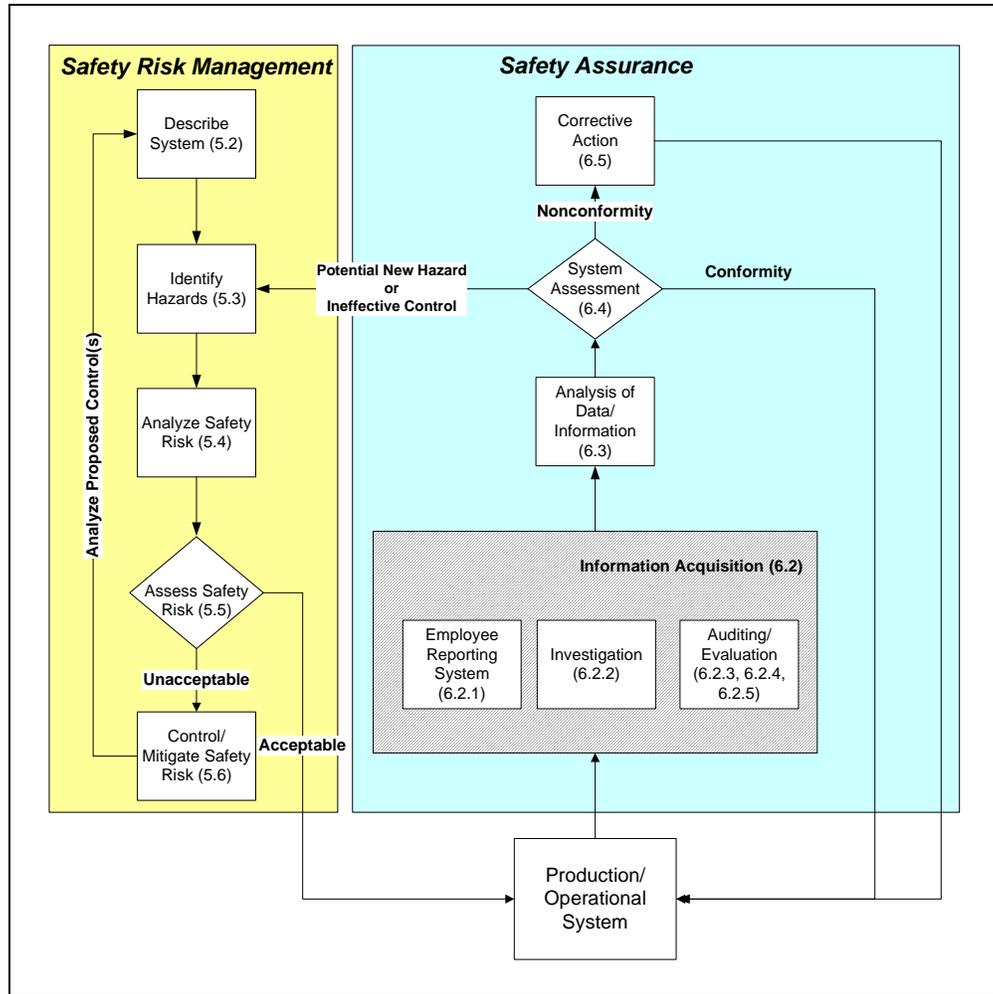


Figure 1 – Safety Risk Management and Safety Assurance

5.2. Describe System

The system description shall be completed to the level necessary to identify hazards.⁷

5.3. Identify Hazards

- A) Hazards shall be identified within the system described per Section 5.2.
- B) The organization shall establish criteria to determine which hazards must be tracked.
- C) Hazards matching the criteria determined in Section 5.3.B shall be tracked.⁸

⁷ 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). Defining a system requires a definition of its boundary and its components.

5.4. Analyze Safety Risk

The safety risk analysis process shall include analyses of:

- 1) existing safety risk controls;
- 2) contributing factors; and
- 3) the safety risk of credible outcomes from the existence of a hazard, to include estimation of the:
 - a) likelihood and
 - b) severity.⁹

5.5. Assess Safety Risk

Each identified hazard shall be assessed for its safety risk acceptability (as defined per requirements listed in Section 5.1.E).

5.6. Control/Mitigate Safety Risk

- A) Safety risk control/mitigation plans shall be defined for hazards identified with unacceptable risk.
- B) Substitute risk shall be considered in the creation of safety risk controls/mitigations.
- C) Once a safety risk control/mitigation is developed, it shall be analyzed to ensure they reduce risk to an acceptable level.
- D) Once safety risk control/mitigation plans are implemented, they shall be monitored to ensure that safety risk controls have the desired effect.

6. Safety Assurance

6.1. General Requirements

The organization shall monitor its systems, operations and products/services to:

- 1) identify new hazards (which would then be acted on within the SRM process as described in Section 5);
- 2) measure the effectiveness of safety risk controls; and
- 3) assess conformity with organizational safety policies and procedures.

6.2. Information Acquisition

- A) The organization shall collect the data/information necessary to demonstrate the effectiveness of the SMS.

⁸ Organizations are encouraged to collaborate in compiling hazard information and to share hazard information throughout the organization and with other air transportation system stakeholders.

⁹ Severity and likelihood may be expressed in qualitative or quantitative terms.

- B) The organization shall monitor operational data/information.
- C) The organization shall ensure the security of collected data so unauthorized personnel cannot access it and/or manipulate it.

6.2.1. Employee Reporting System

- A) The organization shall 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, without reprisal (as allowable by existing legal, regulatory, and statutory requirements).¹⁰
- B) Employees shall be encouraged to use the employee reporting system.

6.2.2. Investigation

- A) The organization shall establish criteria for which accidents and incidents shall be investigated.¹¹
- B) The organization shall establish procedures to:
 - 1) investigate accidents and
 - 2) investigate incidents.

6.2.3. Internal Evaluations of the Production/Operational System

- A) The organization shall ensure that regular internal evaluations of the production/operational system's safety functions are conducted with priority placed on the areas of highest safety risk.¹²
- B) The organization shall ensure that regular evaluations are conducted to:
 - 1) determine conformity with safety risk controls and
 - 2) assess performance of safety risk controls.
- C) Evaluations may be done at planned intervals or as a continuing process.

6.2.4. Internal Evaluation of the SMS

- A) The organization shall conduct internal evaluations of the SMS to assess the effectiveness of the SMS.

¹⁰ This does not restrict management from taking action in cases of gross negligence or willful operation outside the organization's safety requirements.

¹¹ 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, where possible.

¹² The organization may extend this obligation to any contractors that the organization uses. The organization can choose to conduct evaluations of its contractors or require that contractors conduct their own evaluations and provide the resultant data/information to the organization.

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

6.2.5. External Auditing of the SMS

Where applicable, the organization shall include the results of external audits (e.g., oversight organization audits) in the data/information analyses conducted per Section 6.3.

6.3. Analysis of Data/Information

The organization shall analyze the data/information described in Section 6.2.

6.4. System Assessment

A) The organization shall assess the performance of:

- 1) the production/operational system's safety functions against its safety requirements as defined by the SMS and
- 2) the SMS against its requirements.

B) System assessments shall result in the documentation of:

- 1) conformity with existing safety risk controls/SMS requirements (including legal, regulatory and statutory requirements applicable to the SMS);
- 2) nonconformity with existing safety risk controls/SMS requirements (including legal, regulatory and statutory requirements applicable to the SMS);
- 3) potentially ineffective controls; and
- 4) hazards found.

C) The SRM process shall be used if the assessment identifies:

- 1) hazards or
- 2) the need for production/operational system changes.

6.5. Corrective Action

When nonconformities are identified, the organization shall prioritize and implement corrective actions.

6.6. Management Reviews

A) Top management will conduct regular reviews of SMS effectiveness.

B) Management reviews shall assess the need for changes to the SMS.

7. Safety Promotion

7.1. Safety Culture

Top management shall 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, and standards to all employees of the organization;
- 4) an effective employee reporting system (as described in Section 6.2.1.) that provides confidentiality and de-identification as appropriate;
- 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.

7.2. Communication and Awareness

- A) The organization shall communicate SMS outputs to its employees as appropriate.
- B) If applicable, the organization shall provide access to the SMS outputs to its oversight organization, in accordance with established agreements and disclosure programs.
- C) The organization shall 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.

7.3. Personnel Competency

- A) The organization shall document key competencies for those functions identified in Section 4.5.D.
- B) The organization shall ensure that individuals who perform the functions identified in Section 4.5.D meet the documented competency requirements.

7.4. Safety Knowledge Management

The SMS shall 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 should be able to interoperate with other organizations' SMS to cooperatively manage issues of mutual concern.

Appendix A – Comparison of the SMS Standard with Other Standards

The matrix below is provided to assist those organizations developing and implementing an SMS by providing a linkage between existing management system standards and this Standard. The matrix includes links to:

- Quality Management Systems (QMS) via the International Organization for Standardization (ISO) 9001 requirements;
- Environmental Management Systems (EMS) via ISO 14001 requirements; and
- British Standards Institution Occupational Health and Safety Management Systems (BSI OHSMS).

The matrix is intended to assist the developer in building upon existing management systems to develop an SMS that can be integrated with these existing management systems.

Content (Standards)	OHSAS 18001 (OHSMS) *	ISO 14001 (EMS)	ISO 9001:2000/ AS 9100 (QMS)	SMS Standard (SMS)
Scope and Application	1	1	1	1
References (Normative)	2	2	2	2
Definitions	3	3	3	3
Management System Description	4	4	4	4
General Requirements (& Responsibility/Authority (ISO 9000))	4.1	4.1	4.1, 5.5	4.1
Policy (Safety, Environmental, Quality)	4.2	4.2	5.1, 5.3, 8.5	4.2, 4.3
Planning	4.3	4.3	5.4	4.4
Requirements (Hazard/Risk, Environmental Aspects, Customer Requirements)	4.3.1	4.3.1	5.2, 7.2.1, 7.2.2	5
Legal and Other Requirements, Customer Focus (ISO 9000)	4.3.2	4.3.2	5.2, 7.2.1	4.6

Table A-1: SMS Standard Matrix

Content (Standards)	OHASA 18001 (OHSMS) *	ISO 14001 (EMS)	ISO 9001:2000/ AS 9100 (QMS)	SMS Standard (SMS)
Objectives & Targets	4.3.3	4.3.3	5.4.1	4.2.B), 5.1.D), Appendix B
				Appendix B
Programs, Action Planning to Meet Targets, Continual Improvement	4.3.4	4.3.4	5.4.2, 8.5.1	4.1.A), 4.4, 5.6, 7.4
Management Responsibility & Organizational Structure	4.4.1	4.4.1	5 & 6 (Resource mgmt.)	4.5
Personnel Competency/Training	4.4.2	4.4.2	6.2.2	7.3
Communications	4.4.3	4.4.3	5.5.3, 7.2.3	7.2
Documentation & Quality Manual (ISO 9000)	4.4.4	4.4.4	4.2	4.9
Document & Data/Information Control	4.4.5	4.4.5	4.2.3	4.9
Operational Control & Product Realization	4.4.6	4.4.6	7	4.7
Emergency Preparedness & Response, Control of Nonconforming Product (ISO 9000)	4.4.7	4.4.7	8.3	4.8
Performance Measurement & Monitoring	4.5	4.5	8	6.3 & 6.4
Accidents, Incidents, Nonconformity, Corrective & Preventive Action	4.5.2	4.5.2	8.3, 8.5.2, 8.5.3	6.2.1, 6.2.2, 6.4, 6.5
Auditing & Evaluation	4.5.4	4.5.4	8.2.2	6.2.3 – 6.2.5
Management Review	4.6	4.6	5.6	6.6

Table A-1: SMS Standard Matrix (cont'd)

*OHSAS 18001 is an Occupation Health and Safety Assessment Series for health and safety management systems, which was created through a concerted effort from a number of the world's leading national standards bodies, certification bodies, and specialist consultancies.

Appendix B – Example Safety Risk Matrices

As described in Section 5.1.E, the organization must define acceptable levels of safety risk, which includes specific definitions for severity and likelihood. These definitions may be qualitative or quantitative. Safety risk is often characterized using a safety risk matrix, which the organization can design to meet its needs. Figures B-1 – B-4 provide examples of safety risk matrices. These are not intended to be used as templates. The organization should develop a risk matrix (or matrices) that meet its needs.

In the example risk matrices in Figures B-1 – B-4, a hazard that falls in the green section generally indicates that the risk is acceptable. If a hazard is in the blue or yellow section, the hazard is usually also acceptable; however, another level of management and monitoring is typically required. Finally, any hazard that is determined to be in the red area is typically deemed to be unacceptable from a safety risk perspective.

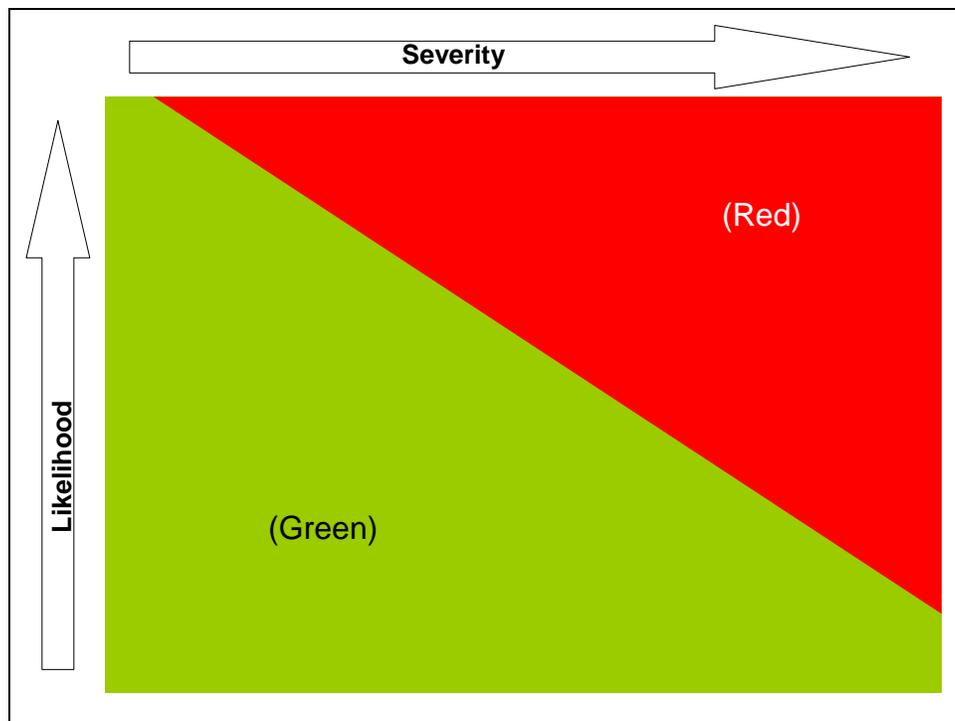


Figure B-1 – Example Risk Matrix (2 Levels)

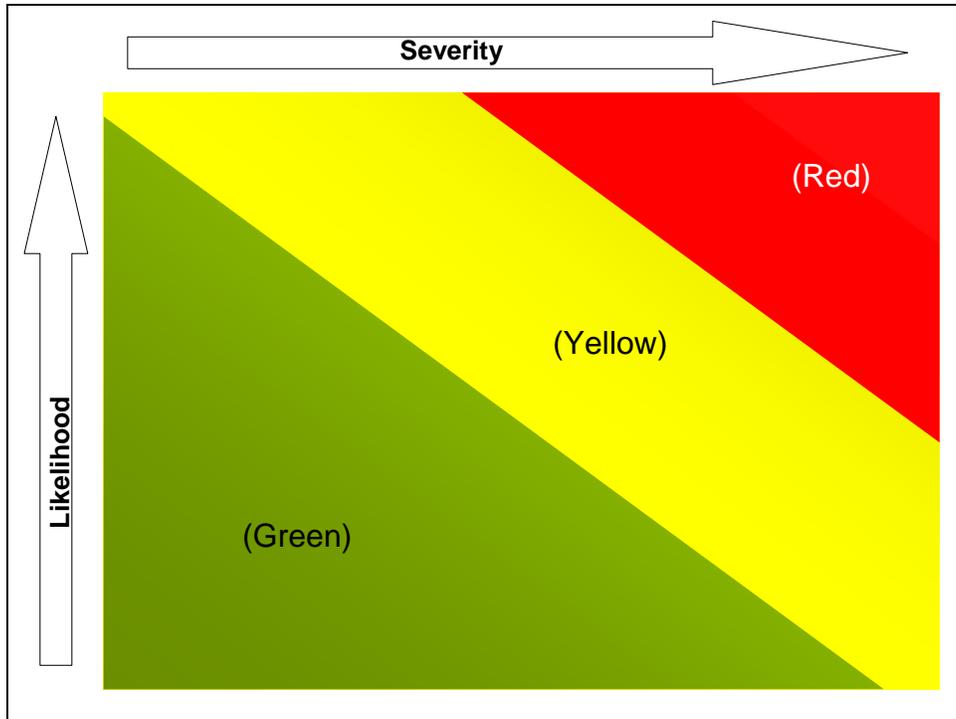


Figure B-2 – Example Risk Matrix (3 Levels)

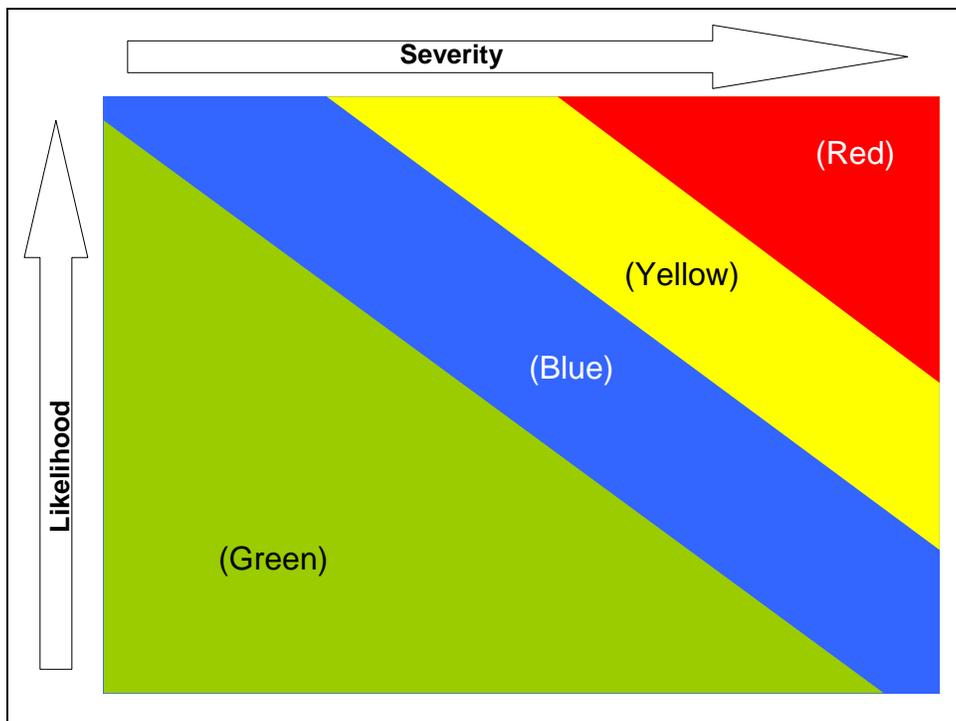


Figure B-3 – Example Risk Matrix (4 Levels)

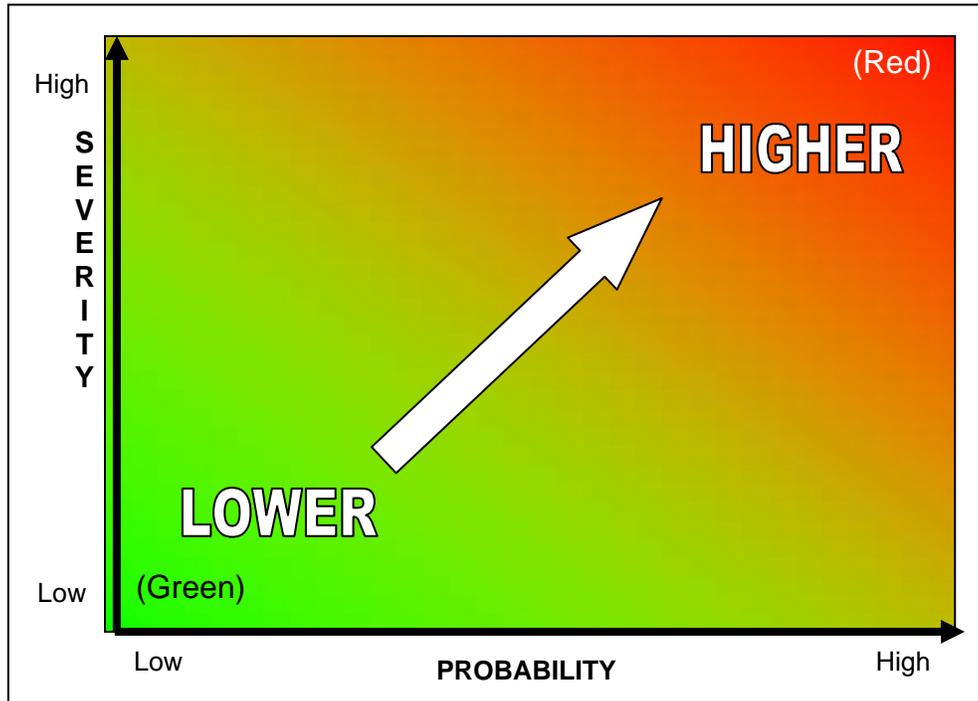


Figure B-4 – Example Risk Matrix (Continuous)

Safety Management System Standard

Document Revision History

VERSION	DATE	DESCRIPTION
SMS-P v9	November 2005	Draft written by SMS SC
SMS-P v18	February 2006	Draft transmitted to SMS SC and SWG; draft revised based on comments received
SMS-P v21	June 2006	Draft transmitted to SMS SC and SWG; draft revised based on comments received
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Next Generation Air Transportation System
Joint Planning and Development Office

SMS v1.3	April 2008	Draft transmitted to JPDO Integration Council; draft revised based on comments received
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SMS v1.4	July 2008	Published on JPDO Web site