National Transportation Safety Board

Federal Aviation Administration

UNITED STATES

STATE SAFETY PROGRAM (SSP)

AVP300-15-U.S. State Safety Program
2015 (Version 1.0)

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FOREWORD

2014 marked the 100th anniversary of commercial flight. We have seen great advancements: from the jet age to the glass cockpit to non-stop routes across the globe. Since its first flight, commercial aviation has carried more than 65 billion passengers. Aviation is evolving quickly, and it has been forecast that this industry will carry its next 65 billion passengers in the next 15 to 20 years.

The past several decades have shown us many successes in aviation and safety has come a long way. The United States (U.S.) has a mature regulatory framework, well-defined roles and responsibilities, advanced accident and incident investigation capabilities, effective certification, surveillance and enforcement processes, exceptional capacity for data collection and analysis, the ability to focus on areas of greatest safety risk, and established means to communicate with service providers, government representatives, and other stakeholders. Because of these safety advances, we are now in an era in which accidents are extremely rare. But, the landscape continues to change, and we must ensure this high level of safety as the industry and technology continue to evolve.

We will continue to ensure aviation safety by building on safety management principles to proactively address emerging safety risk by using consistent, data-informed approaches to make smarter, system-level, risk-based decisions. We will work with industry to gain invaluable information that we need to enhance safety. We will continue to partner with the national and international aviation community to spread the safety net through communication of safety information, smarter regulation and cost effective measures to achieve a vibrant aviation system. The success of commercial aviation over the past century has been largely due to the exponential growth and innovation of technology. Today and in the future, our success will depend on how we collaborate. We can achieve our collective goals more rapidly when we collaborate and leverage each other's efforts globally.

The U.S. supports the International Civil Aviation Organization (ICAO) efforts to establish a State Safety Program (SSP) for Member States to better ensure effective integration of aviation safety standards and practices aimed at improving safety. We will review the U.S. SSP on a regular basis to ensure it reflects evolving aviation safety standards and practices.

Michael P. Huerta
Administrator
Federal Aviation Administration

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Acting Chairman
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INTRODUCTION

Nearly 70,000 flights are operating in the United States (U.S.) aerospace system on any given day.[1] Through hard work, innovation, and perseverance, we have achieved the best safety record in the history of aviation. The size and complexity of our infrastructure, the diversity of our user groups, our commitment to safety and excellence, and our leadership in the world's aviation community set us apart. Building on this solid foundation, we are heading into an era of rapid technological advances in communication, navigation, and surveillance and unprecedented challenges in the presence of changing economic, social, environmental, and energy needs of our nation, our industry, and our global partners. Our mature safety system will need processes for continuous improvement.

The U.S. supports the International Civil Aviation Organization (ICAO) efforts to establish State Safety Program (SSP) requirements for Member States to better ensure effective integration of aviation safety standards and practices. This builds on the approach endorsed by ICAO to have aviation service providers establish comprehensive Safety Management Systems (SMS) to guide the management of the range of activities involved in ensuring safety. ICAO defines the SSP as an integrated set of regulations and activities aimed at improving safety. They include specific safety activities that must be performed by the State, together with regulations and directives to support fulfillment of the State's responsibilities concerning safe and efficient delivery of aviation activities in the State. The SSP Framework is currently provided as guidance material as an attachment to Annex 19. The SSP Framework combines the components of both the prescriptive and performance based approaches to the management of aviation safety and incorporates the following elements:

- *State safety policy and objectives*
  - 1.1 State safety legislative framework
  - 1.2 State safety responsibilities and accountabilities
  - 1.3 Accident and incident investigation
  - 1.4 Enforcement policy
- *State safety risk management*
  - 2.1 Safety requirements for service provider's SMS
  - 2.2 Agreement on service provider's safety performance
- *State safety assurance*
  - 3.1 Safety oversight
  - 3.2 Safety data collection, analysis and exchange
  - 3.3 Safety data driven targeting of oversight on areas of greater concern or need
- *State safety promotion*
  - 4.1 Internal training, communication and dissemination of safety information
  - 4.2 External training, communication and dissemination of safety information

Appendix A, *ICAO SSP Framework*, contains more detail on these elements.

[1] *FAA Fiscal Year 2013 Performance and Accountability Report* (page 5): http://www.faa.gov/about/plans_reports/media/2013_FAA_PAR.pdf. Accessed September 17, 2014.

The U.S. currently meets the intent of the elements outlined in the ICAO SSP Framework, with a mature regulatory framework, well-defined roles and responsibilities, advanced accident and incident investigation capabilities, effective certification, surveillance and enforcement processes, exceptional capacity for data collection and analysis, the ability to focus on areas of greatest safety risk, and established means to communicate with service providers, government representatives, and other stakeholders. To support its mission to provide the safest, most efficient aerospace system in the world, the Federal Aviation Administration (FAA) is implementing an SMS to systematically integrate the management of safety risk into business planning, operations, and decision making.

The FAA SMS goes beyond SSP requirements because it includes identification of hazards and mitigation of the risk associated with them. The FAA chose to implement an SMS because it includes both regulatory and product/service provider organizations. The FAA SMS will meet most of the tenets of both the ICAO SSP and SMS frameworks, thereby ensuring interoperability among safety management functions in FAA organizations.

While the U.S. meets the intent of the ICAO SSP Framework requirements, there are currently limited SMS regulations for industry. The U.S. is engaged in rulemaking activities for some aviation sectors; however, when this is not feasible due to the U.S. regulatory structure, the FAA plans to establish voluntary SMS implementation programs to cover the entire aviation system.

The U.S. currently measures many aspects of an acceptable level of safety performance throughout its complex aviation system. Most of this measurement is done on specific components of the system such as air carriers or air traffic management. The U.S. recognizes the importance of improving safety performance management capabilities; the FAA established working groups to further develop the safety measurement framework and to determine how it will be applied by the FAA. Through these activities, the FAA will improve its capability to measure safety across the aviation system through the development and use of additional safety indicators, as well as identify acceptable levels of safety at the system- and component-levels.

This document describes how the U.S. meets the 11 ICAO SSP Framework elements and describes additional activities that will help improve the U.S. SSP and respond to future safety challenges. This document does not supersede any specific regulation, instruction, or order pertaining to specific rules or requirements. The SSP Framework was included in ICAO Annexes 1, 6, 8, 11, 13, and 14, which cover personnel licensing, aircraft operators, approved maintenance organizations, manufacturers, air traffic services, accident investigation, and airports. These requirements have recently been moved to the new ICAO Annex 19. While multiple U.S. government agencies contribute to the U.S. SSP, this document focuses on the role of the FAA and the National Transportation Safety Board (NTSB), because those two organizations fulfill the majority of SSP related functions identified in Annexes 1, 6, 8, 11, 13 and 14 for the U.S. The U.S. SSP will be reviewed at least every three years, to ensure it reflects evolving aviation safety standards and practices.

Appendix B, *Acronyms/Abbreviations*, contains a list of acronyms used in this document. Appendix C, *Related Documents*, contains a list of international standards, U.S. regulations, multi-agency safety documents, and U.S. government agency orders, procedure documents, plans, and training related to SSP.

State Safety Policy & Objectives

The State safety policy and objectives component defines how the U.S. will manage safety throughout its aviation system. This includes the determination of responsibilities and accountabilities of the different State organizations related to the SSP, as well as the determination of the broad safety objectives to be achieved by the SSP.

The State safety policy and objectives provide management and personnel explicit policies, directions, procedures, management controls, documentation, and corrective action processes that keep the safety management efforts of the State's civil aviation authority, and other State organizations, on track. This enables the U.S. to provide safety leadership in an increasingly complex and continuously changing air transportation system. These are the U.S. safety objectives:

- Ensure that the U.S. safety system as a whole works effectively and that key players are working together in the interests of safety.
- Ensure U.S. safety regulatory and investigatory agencies remain world leading and have the skills and capabilities to maintain safety.
- Build on today's proactive accident prevention programs by adopting new tools and metrics to further anticipate potential sources of risk to identify and mitigate accident precursors and contributors, and strategically manage safety resources for maximum safety improvement in a cost effective manner.
- Build on safety management principles to proactively address emerging safety risk by using consistent, data-informed approaches to make smarter, system-level, risk-based decisions throughout U.S. aviation agencies, with industry, and global stakeholders.
- Collaborate with domestic and international stakeholders to encourage cooperation for the open reporting of safety concerns.
- Increase safety and efficiency by taking advantage of the growing availability of safety data and the development of additional analytical capabilities to systematically integrate the management of safety risk into decision making.
- Focus safety management activities toward higher risk areas and refine safety oversight models to prioritize safety inspection efforts based on risk.
- Collaborate with the international aviation community to achieve smarter regulation for safety and cost effective measures to achieve sustainable aviation.

The following policy statement[2] captures the U.S. commitment to the industry and to the international community on how it will approach the management of safety to achieve these objectives.

[2] The U.S. policy statement is based on the template provided in ICAO's *Safety Management Manual* in Appendix 1 to Chapter 4, Guidance on the development of a State safety policy statement: http://www.icao.int/safety/SafetyManagement/Documents/Doc.9859.3rd%20Edition.alltext.en.pdf. Accessed September 17, 2014.

State Safety Program Policy Statement

The FAA promotes and regulates the safety of aviation in the United States. The FAA is committed to developing, implementing, and consistently improving strategies and processes to ensure that U.S. civil aviation achieves the highest practicable level of safety.

To this end the FAA will:

- Set national standards that are in line with ICAO standards, recommended practices, and procedures, except where different standards are necessary in the U.S. for specific operational purposes or in instances where a greater level of safety is sought;
- Adopt a data-informed and performance-based approach in safety regulation and industry oversight activities where appropriate;
- Identify safety trends within the aviation industry and adopt a risk-based approach to address areas of greater safety concern or need;
- Monitor and measure the safety performance of the aviation system continuously through U.S. aggregate safety indicators, as well as service providers' safety performance indicators;
- Collaborate and consult with the aviation industry to address safety matters and continuously enhance aviation safety;
- Promote good safety practices and a positive organizational safety culture within industry and U.S. organizations based on sound safety management principles;
- Encourage safety information collection, analysis, and exchange amongst all relevant industry organizations and service providers, with the intent that such information is to be used for safety management purposes only;
- Prioritize sufficient financial and human resources for safety management and oversight; and
- Hire and equip staff with proper skills and expertise to discharge their safety oversight and management responsibilities competently.

The NTSB assures compliance with U.S. obligations under ICAO Annex 13 (Aircraft Accident and Incident Investigation). The NTSB is committed to independently investigating every civil aviation accident in the U.S. and issuing safety recommendations aimed at preventing future accidents.

To this end, the NTSB will:

- Collaborate with the aviation industry to address safety matters and continuously enhance aviation safety;
- Promote good safety practices and a positive organizational safety culture within the industry based on sound safety management principles;
- Prioritize sufficient financial and human resources for accident and incident investigations; and
- Equip staff with proper skills and expertise to discharge their accident and incident investigation responsibilities competently.

Although the FAA Administrator is the *Responsible Executive* who represents the U.S. regarding commitments made in the name of the U.S., this U.S. SSP document is signed by both the FAA Administrator and the NTSB Chairperson. As this document is signed by both the FAA and the NTSB, it is the U.S. SSP Policy. The policy will be communicated, with visible endorsement, throughout the FAA and the NTSB, and will be periodically reviewed to ensure it remains relevant and appropriate to the U.S. aviation system.

1.1 State Safety Legislative Framework

The U.S. possesses a national safety legislative framework and specific regulations, in compliance with international and national standards, that define how the U.S. conducts the management of aviation safety in the U.S. The safety legislative framework and specific regulations are periodically reviewed to ensure they remain relevant and appropriate to the U.S.

1.1.1 United States Legislative System

U.S. federal government agencies, including the FAA, are under the auspices of the executive branch, but receive statutory authority to issue regulations from laws enacted by the legislative branch (U.S. Congress). An agency may not take action that goes beyond its statutory authority; otherwise, it violates the U.S. Constitution.

The Administrative Procedure Act (APA)[3], enacted June 11, 1946, requires agencies to establish uniform standards for rulemaking and adjudication; inform the public of organization, procedures, and rules; and allow for public participation in the rulemaking process. Thus, agencies must follow an open, public process when issuing rules and other materials that impact the rights of the persons being regulated.

Unless there is a good cause, the APA requires proposed rules to be published in the *Federal Register.*[4] Agencies must invite and consider public comment on the proposal, and the final rule must also be published in the *Federal Register*. The agency must also explain why it took any particular action in the preamble to both the proposal and final rules. The vast majority of federal regulations are issued using this "notice and comment" process.

1.1.2 United States Aviation Legislation

The primary aviation legislation of the U.S. is set forth in Title 49 of the United States Code (USC) —Transportation.[5] The U.S. Congress periodically amends Title 49 USC to authorize appropriations for the FAA and to streamline programs, create efficiencies, reduce waste, and improve aviation safety and capacity. Not only does the U.S. Congressional reauthorization process ensure provision of stable funding for the national aviation system, it forces the executive branch government agencies to continuously assess and improve its operations as necessary.

Also within the U.S. government, the U.S. Government Accountability Office (GAO), an independent, nonpartisan agency that works for the U.S. Congress, investigates how the federal government spends taxpayer dollars, offers recommendations for performance improvement, and ensures the accountability of the federal government.[6] Similarly, the FAA is accountable to the Office of Inspector General (OIG) within the Department of Transportation (DOT).[7] The OIG promotes effectiveness and heads off, or stops, waste, fraud, and abuse in departmental programs through audits and investigations. OIG also consults with the U.S. Congress about programs in progress and proposed new laws and regulations.

Below is a brief history of aviation legislation in the U.S.

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[3] Administrative Procedure Act (5 USC Subchapter II): http://www.archives.gov/federal-register/laws/administrative-procedure/. Accessed September 17, 2014.
[4] *Federal Register*, The Daily Journal of the United States Government: https://www.federalregister.gov/. Accessed September 17, 2014.
[5] Title 49 USC: http://www.gpo.gov/fdsys/pkg/USCODE-2011-title49/html/USCODE-2011-title49.htm. Accessed September 17, 2014.
[6] GAO website: http://www.gao.gov/. Accessed September 17, 2014.
[7] DOT OIG website: https://www.oig.dot.gov/. Accessed September 17, 2014.

The Federal Aviation Act of 1958[8] was an act of the U.S. Congress that created the independent Federal Aviation Agency (later the Federal Aviation Administration, or the FAA) and abolished its predecessor, the Civil Aeronautics Administration. The act empowered the FAA to oversee and regulate safety of civil aviation and to provide for the safe and efficient use of the U.S. airspace by both military and civilian aircraft. The act transferred safety rulemaking to the new FAA and gave the FAA sole responsibility for a common civil-military system of air navigation and air traffic control.

In 1966, Congress authorized the creation of a cabinet department that would combine major Federal transportation responsibilities into a single department to develop and carry out comprehensive transportation policies and programs across all transportation modes.[9] This new DOT began full operations on April 1, 1967. On that day, the Federal Aviation Agency became one of several modal organizations within DOT and received a new name, the Federal Aviation Administration. At the same time, the Civil Aeronautics Board's accident investigation function was transferred to the new NTSB.[10]

With the passage of the Airport and Airway Development Act of 1970, the FAA was placed in charge of a new airport aid program funded by a special aviation trust fund and was made responsible for safety certification of airports served by air carriers.[11]

The Hazardous Materials Transportation Act of 1975, 49 USC 5101 et seq., grants the DOT authority to regulate the transportation of hazardous materials by all modes. While the Pipeline and Hazardous Materials Safety Administration (PHMSA) has authority to promulgate the hazardous materials regulations for all transportation modes, the FAA has authority to oversee compliance with these regulations by certificated entities and shippers of hazmat via aircraft.

Aviation legislation was last recodified in 1994, and Title 49 USC was passed by Congress and signed into law by the President on July 5, 1994 (with subsequent amendments) to supersede the Federal Aviation Act of 1958.

In April 2000, the President signed into law the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, which contained a provision mandating the appointment of a chief operating officer for the Air Traffic Organization (ATO).[12] In a December 2000 executive order (EO), the President directed the FAA to create a performance-based organization that focused on further improving the provision of air traffic services, in ways that increase efficiency, take better advantage of new technologies, accelerate modernization efforts, and respond effectively to the needs of the traveling public, while enhancing the safety, security, and efficiency of the U.S. air transportation system."

The tragic events of September 11, 2001 radically changed the FAA. On November 19, 2001, the President signed the Aviation and Transportation Security Act, which among other

[8] The Federal Aviation Act of 1958: http://libraryonline.erau.edu/online-full-text/books-online/Aviationlawpt1.pdf. Accessed September 17, 2014.
[9] 49 USC Subtitle I — Department of Transportation establishes in §106 the Federal Aviation Administration (FAA) within the Department of Transportation (DOT), which is responsible for economic governance of civil aviation.
[10] 49 USC Subtitle II — Other Government Agencies, Chapter 11 establishes the National Transportation Safety Board (NTSB) as the permanent and independent authority in charge of "investigating, reporting on, and determining the probable cause of accidents" for all modes of transportation, including civil aviation.
[11] The Airport and Airway Development Act of 1970: http://libraryonline.erau.edu/online-full-text/books-online/AirportAirwayDev1970wa1978.pdf. Accessed September 17, 2014.
[12] The Wendell H. Ford Aviation Investment and Reform Act for the 21st Century: http://www.gpo.gov/fdsys/pkg/PLAW-106publ181/pdf/PLAW-106publ181.pdf. Accessed September 17, 2014.

provisions, established a new agency responsible for aviation security—the Transportation Security Administration (TSA), within DOT.[13] FAA remained responsible for aviation security until February 13, 2002, when TSA took over those responsibilities. The November 2002, passage of the Homeland Security Act[14] moved TSA into the new Department of Homeland Security (DHS) on March 1, 2003.

The Vision 100 — Century of Aviation Reauthorization Act, signed into law in December 2003, endorsed the concept of a Next Generation Air Transportation System (NextGen).[15] The following month, the DOT Secretary announced plans for a new, multi-year, multi-agency effort to develop an air transportation system for the year 2025 and beyond. He subsequently established a Joint Planning and Development Office (JPDO) at the FAA composed of representatives from FAA, National Aeronautics and Space Administration (NASA), the Departments of Transportation, Defense, Homeland Security, and Commerce, and the White House Office of Science and Technology Policy to create and carry out an integrated plan for NextGen. On December 15, 2004, DOT unveiled the *Integrated Plan for the Next Generation Air Transportation System*, which laid out goals, objectives, and requirements necessary to create the NextGen system.

In August 2010, Congress passed the Airline Safety and FAA Extension Act, which directed the FAA through legislation to change requirements to improve pilot rest requirements, establish better processes for managing safety risk, and advance voluntary safety programs.[16]

On February 14, 2012, the President signed the FAA Modernization and Reform Act of 2012[17] which will modernize the nation's aviation system. The law provides $63.4 billion in FAA funding over four years, including about $11 billion toward the modernization of the air traffic control system. The law sets the stage for major advancements in the aviation industry and aims to improve airline safety and set the course for a more efficient U.S. air transportation system.

1.1.3 Aviation Safety Regulation

In addition to legislation, the U.S. aviation safety system is composed of a range of subordinate documents such as regulations, policy, and guidance material.

The Code of Federal Regulations (CFR) is the compilation of the general and permanent rules of federal agencies and departments published in the *Federal Register*. Each title of the CFR is divided into chapters, each chapter divides into “parts” and “subparts” which are further allocated into “sections.” The FAA regulations that govern today’s aircraft are found in Title 14 of the Code of Federal Regulations (14 CFR), Aeronautics and Space, as shown in Figure 1.[18] The FAA is responsible for 14 CFR parts 1-199 and 400-499.[19]

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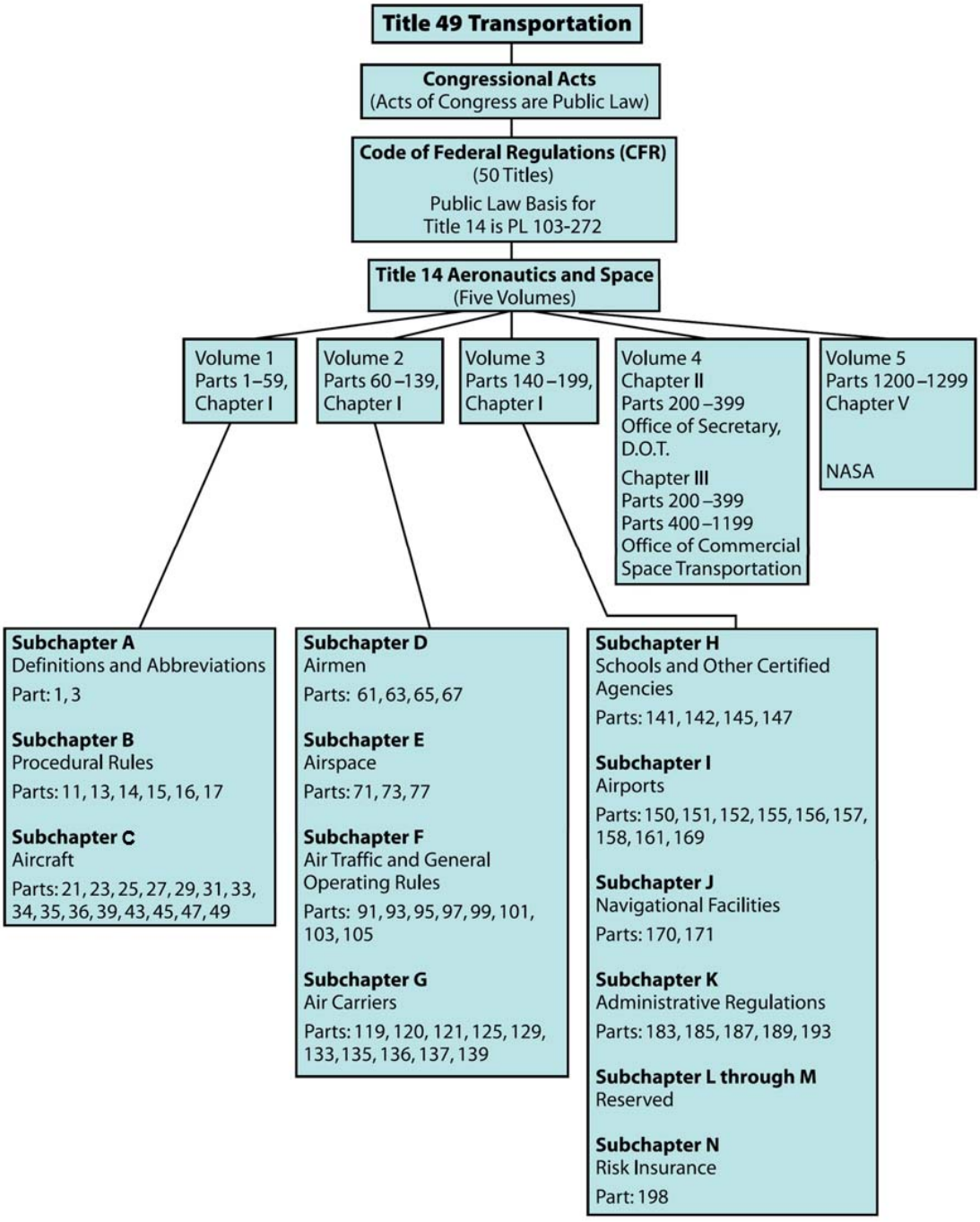
[13] The Aviation and Transportation Security Act: http://www.gpo.gov/fdsys/pkg/PLAW-107publ71/html/PLAW-107publ71.htm. Accessed September 17, 2014.
[14] The Homeland Security Act: http://www.gpo.gov/fdsys/pkg/PLAW-107publ296/html/PLAW-107publ296.htm. Accessed September 17, 2014.
[15] The Vision 100 - Century of Aviation Reauthorization Act: http://www.gpo.gov/fdsys/pkg/PLAW-108publ176/pdf/PLAW-108publ176.pdf. Accessed September 17, 2014.
[16] The Airline Safety and FAA Extension Act: http://www.gpo.gov/fdsys/pkg/PLAW-111publ216/html/PLAW-111publ216.htm. Accessed September 17, 2014.
[17] The FAA Modernization and Reform Act of 2012: http://www.faa.gov/regulations_policies/reauthorization/media/PLAW-112publ95[1].pdf. Accessed September 17, 2014.
[18] Additional information on 14 CFR can be found on the U.S. Government Printing Office website: http://www.gpo.gov/fdsys/pkg/CFR-2004-title14-vol1/content-detail.html. Accessed September 17, 2014.
[19] Hazardous Materials regulations can be found in 49 CFR, Transportation, parts 100-185: http://www.ecfr.gov/cgi-bin/text-idx?SID=1d6ba49dd2173fcde628f46ee295ddc1&tpl=/ecfrbrowse/Title49/49tab_02.tpl. Accessed November 12, 2014.

Figure 1: Title 14 of the Code of Federal Regulations



As discussed previously, the FAA was established by the U.S. Congress as part of the Executive Branch and is empowered to make regulations for organizations for which it oversees. The FAA has extensive processes in place which are used to propose, initiate, and finalize FAA rulemaking documents in accordance with applicable statutes, executive orders, and *Federal Register* requirements. Specifically, the FAA *Rulemaking Work Instructions (RWI)* document describes how the FAA develops rules that become regulations in 14 CFR.

The FAA has the authority to adopt regulations that may have the force and effect of law. Typically, the FAA adopts regulations by following the steps listed below:

- Identify a need for rulemaking;
- Get approval to start working;
- Develop a schedule and start drafting a rulemaking document;
- Finish the document and send it for review and approval;
- Publish the document for public comment;
- Analyze the comments and decide what to do next;
- Get review and approval to develop a final rule; and
- Write the final rule; send it for review, approval, and publication.

There are many factors that indicate a need for rulemaking, such as:

- Laws passed by Congress;
- Recommendations resulting from accident investigations;
- Availability of new technology;
- Changes in industry practice;
- Internal FAA safety analyses;
- Desire to harmonize FAA's regulations with those of other nations;
- Petitions for rulemaking submitted by members of the public; or
- Exemptions from FAA regulations.

Rulemakings vary in size and complexity. Sometimes there is good cause to forgo requesting public comments. At other times, documents may be reopened for a second round of comments. FAA policy enables and invites public participation in the rulemaking process when public comments are deemed appropriate. The public can participate by:

- Submitting comments on a proposed rulemaking document;
- Requesting, or participating in, an FAA-sponsored public meeting on a rulemaking action;
- Asking the FAA to extend or reopen a comment period; or
- Filing a petition for rulemaking that asks the FAA to adopt, amend, or repeal a regulation.

In addition to legislation and regulations, the U.S. also produces aviation safety policies and guidance materials related to the management of aviation safety in the U.S. FAA orders, notices, and bulletins are documents that provide information to FAA employees on what the FAA expects of applicants and certificate holders. These documents are sometimes accompanied by handbooks and manuals.

The FAA also issues information as guidance to U.S. aerospace system users and product/service providers, such as[20]:

- General Notices (GENOT);
- Advisory Circulars (AC);
- Airworthiness Directives (AD);
- Notices to Airmen (NOTAM);
- Temporary Flight Restrictions (TFR); and
- Safety Oversight Circulars (SOC).

[20] Additional information on specific guidance can be found on the FAA website: http://www.faa.gov/regulations_policies/. Accessed September 17, 2014.

1.1.4 Regulatory Review Requirements

The U.S. government has several regulatory review requirements to ensure regulations remain effective and are not burdensome to the public. Below are two specific U.S. government-wide regulatory review requirements:

- Section 610 from the Regulatory Flexibility Act (5 USC § 610(c)) requires U.S. government agencies to review rules that have a "significant" economic impact upon a substantial number of small entities within ten years of the publication of such rules as final rules. The purpose of the review is "to determine whether such rules should be continued without change, or should be amended or rescinded…to minimize any significant economic impact of the rules upon a substantial number of such small entities." The purpose outlined in the Act is to assess the:
    - Continued need for the rule;
    - Nature of complaints or comments received concerning the rule from the public;
    - Complexity of the rule;
    - Extent to which the rule overlaps, duplicates, or conflicts with other Federal rules, and, to the extent feasible, with State and local governmental rules; and
    - Length of time since the rule has been evaluated or the degree to which technology, economic conditions, or other factors have changed in the area affected by the rule.

- EO 12866 (Regulatory Planning and Review) is a program to reform and make more efficient the regulatory process and to ensure it meets applicable statutory requirements. Under this EO, the Office of Management and Budget (OMB) was tasked to conduct a coordinated review of agency rulemaking to ensure that regulations are consistent with applicable law and the President's priorities, and that decisions made by one agency do not conflict with the policies or actions taken or planned by another agency. The EO also requires agencies to have a program to periodically review its "significant regulations to determine whether any such regulations should be modified or eliminated so as to make the agency's regulatory program more effective in achieving the regulatory objectives, less burdensome, or in greater alignment with the President's priorities and the principles set forth in EO 12866."

The DOT's Review Plan[21] also discusses these review requirements.

There are also other ways the FAA reviews rules to ensure adherence to regulatory responsibilities. FAA Lines of Business (LOBs), based on their mission and regulatory oversight responsibilities, are responsible for updating their specific rules (including ADs) based on various triggers, such as laws passed by Congress, NTSB recommendations, internal FAA safety analyses, etc. Additionally, the Rulemaking Office in the FAA conducts a systematic review during rulemaking coordination to ensure the proposed and final rules adhere to the pertinent regulatory requirements, such as the Paperwork Reduction Act.

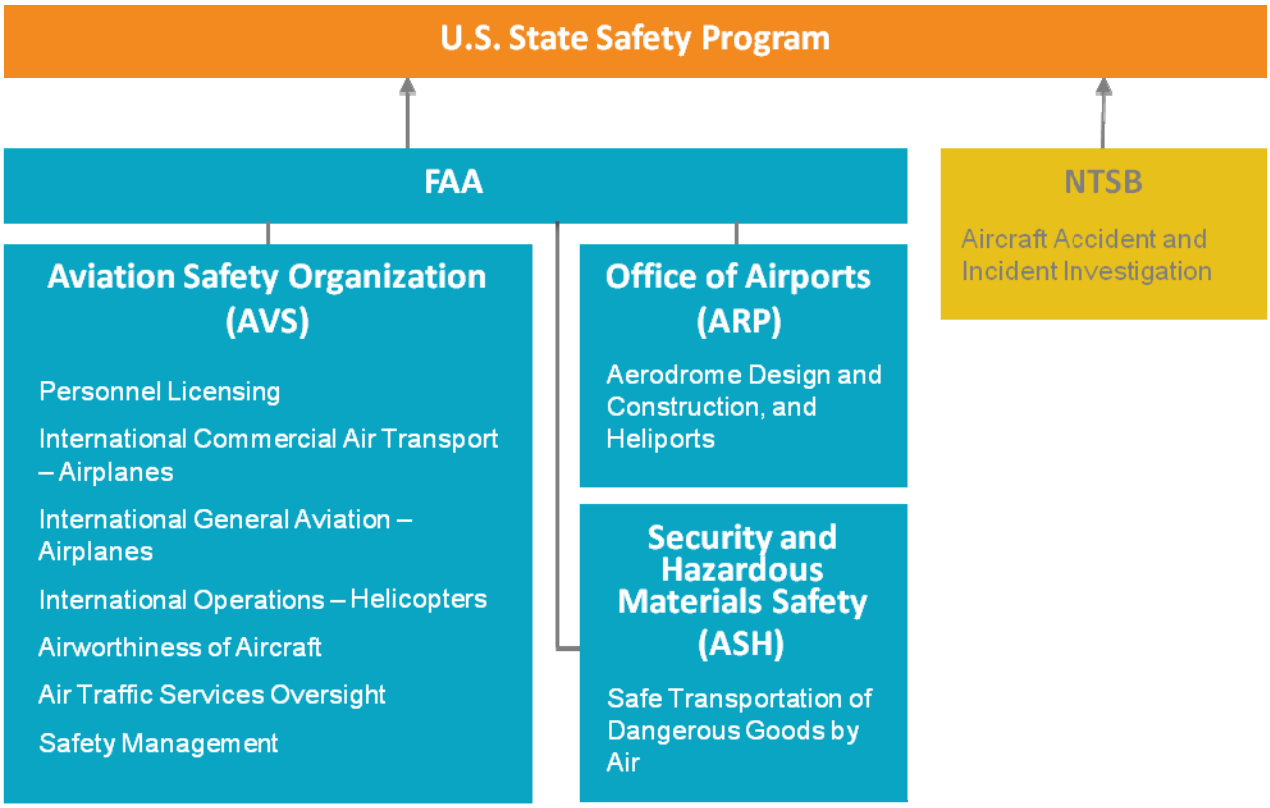
1.2 State Safety Responsibilities and Accountabilities

The U.S. civil aviation safety system encompasses a number of government agencies with specific functions and responsibilities. As discussed in the *Introduction* section of this document, multiple U.S. government agencies contribute to the U.S. SSP, but this document focuses on the roles of the FAA and the NTSB because those two organizations fulfill the majority of SSP

[21] DOT's Review Plan: http://www.dot.gov/regulations/dots-review-plan. Accessed September 17, 2014.

related functions for the U.S. Figure 2 shows the agencies and LOBs within the FAA, and their relationships to the ICAO Annexes.

Figure 2: U.S. State Safety Program



1.2.1 Department of Transportation (DOT)

The DOT was established by an act of Congress on October 15, 1966. The mission of the Department is to:

> *Serve the United States by ensuring a fast, safe, efficient, accessible and convenient transportation system that meets our vital national interests and enhances the quality of life of the American people, today and into the future.*

Leadership of the DOT is provided by the Secretary of Transportation, who is the principal adviser to the U.S. President in all matters relating to federal transportation programs. The Secretary is assisted by the Deputy Secretary in this role. The Office of the Secretary (OST) oversees the formulation of national transportation policy and promotes intermodal transportation. Other responsibilities include negotiating and implementing international transportation agreements, assuring the fitness of U.S. airlines, enforcing airline consumer protection regulations, issuing regulations to prevent alcohol misuse and illegal drug use in transportation systems, and preparing transportation legislation.

1.2.2 Federal Aviation Administration (FAA)

An agency of the U.S. DOT, the FAA is the national aviation authority of the United States. It has authority to regulate and oversee all aspects of U.S. civil aviation. The Federal Aviation Act

of 1958 created the organization under the name "Federal Aviation Agency," and its current name was adopted in 1966 when it became a part of the U.S. DOT.

The FAA oversees the safety of civil aviation. The safety mission of the FAA is first and foremost and includes the issuance and enforcement of regulations and standards related to the manufacture, operation, certification, and maintenance of aircraft. The agency is responsible for the rating and certification of airmen, and for certification of air carriers, repair stations, and airports. It also oversees a program to protect the security of civil aviation, and enforces regulations under the Hazardous Materials Transportation Act[22] for shipments by air. Furthermore, the FAA regulates and encourages the U.S. commercial space transportation industry, and licenses commercial space launch facilities and private sector launches.

The ATO, a LOB within the FAA, is the Air Navigation Service Provider (ANSP) for the U.S. It operates a network of airport towers, air route traffic control centers, and flight service stations; and it develops air traffic rules, allocates the use of airspace, and provides for the security control of air traffic to meet national defense requirements. Other responsibilities include the construction or installation of visual and electronic aids to air navigation and the promotion of aviation safety internationally.

The FAA has authority over all civil aviation matters in the U.S. and coordinates with ICAO. The FAA Administrator is the coordinating point for ICAO purposes and is responsible for the development and maintenance of this document and for monitoring and reporting on the progress of the SSP activities. The Administrator's role with regard to the U.S. SSP is further discussed in Section 1.3.4, *Coordination within the U.S. Aviation Safety System*.

Aviation Safety Organization (AVS)

AVS is the FAA organization responsible for the certification, production approval, and continued airworthiness of aircraft; and certification of pilots, mechanics, and others in safety-related positions. Specifically, AVS is responsible for assuring compliance with U.S. obligations under the following ICAO Annexes:

- Annex 1: Personnel Licensing;
- Annex 2: Rules of the Air;
- Annex 6: International Commercial Air Transport – Aeroplanes; International General Aviation – Aeroplanes; and International Operations – Helicopters;
- Annex 7: Aircraft Nationality and Registration Marks;
- Annex 8: Airworthiness of Aircraft;
- Annex 10: Aeronautical Telecommunications (Radio Navigation Aids; Communications Procedures; Communications Systems; Surveillance Radar and Collision Avoidance Systems; and Aeronautical Radio Frequency Spectrum Utilization);
- Annex 11: Air Traffic Services; and
- Annex 19: Safety Management.

AVS is also responsible for:

- Certification of all operational and maintenance enterprises in domestic civil aviation;
- Certification and safety oversight of approximately 7,300 U.S. commercial airlines and air operators;
- Civil flight operations; and
- Developing safety regulations.

[22] The Hazardous Materials Transportation Act: http://www.epa.gov/oem/content/lawsregs/hmtaover.htm. Accessed September 14, 2014.

To execute its SSP responsibilities, AVS is organized into the following Services and Offices:

- The Flight Standards Service (AFS) promotes safe air transportation by setting the standards for certification and oversight of airmen, air operators, air agencies, and designees. AFS also promotes safety of flight of civil aircraft and air commerce by:
    - Accomplishing certification, inspection, surveillance, investigation, and enforcement;
    - Setting regulations and standards; and,
    - Managing the system for registration of civil aircraft and all airmen records.

- The FAA Aircraft Certification Service (AIR) is the office responsible for:
    - Administering safety standards governing the design, production, and airworthiness of civil aeronautical products;
    - Overseeing design, production, and airworthiness certification programs to ensure compliance with prescribed safety standards;
    - Providing a safety performance management system to ensure continued operational safety (COS) of aircraft; and
    - Working with aviation authorities, manufacturers, and other stakeholders to help them successfully improve the safety of the international air transportation system.

- The Office of Aerospace Medicine (AAM) is responsible for a broad range of medical programs and services for both the domestic and international aviation communities including:
    - Aerospace medical education;
    - Aerospace medical and human factors research;
    - Regulation and oversight of industry drug and alcohol testing programs;
    - FAA employee substance abuse testing programs;
    - Medical clearance of FAA air traffic control specialists and other agency employees required to meet medical standards to perform safety-sensitive duties;
    - Medical certification/qualification of airmen and other persons associated with safety in flight;
    - Airman medical regulations, standards, policies, and procedures; and
    - Management and oversight of designees that support the AAM mission.

- The Air Traffic Safety Oversight Service (AOV) establishes safety standards and provides independent oversight of the ATO – the ANSP in the U.S. The ATO is also a part of the FAA, and its relationship with AOV is further discussed in Section 1.5.3, *AOV Enforcement of ANSP (ATO) SMS Policy.* This safety oversight is accomplished in a variety of ways including:
    - Developing and amending regulations and guidance for regulatory oversight and credentialing functions;
    - Participating in the development and harmonization of air traffic control international standards;
    - Providing regulatory oversight and approval of the ATO SMS;
    - Approving and validating the ATO safety-related processes used for introduction of new separation standards, and modification of existing separation standards;
    - Approving new standards and waivers, and the extension and modification of existing waivers;
    - Analyzing, approving, and authorizing controls used by the ATO to mitigate hazards;
    - Participating in the conduct of operational and procedural review and analysis of information pertaining to employees, operations and programs; and,

    - Auditing, inspecting, and monitoring ATO compliance with safety standards and the SMS.

- The Office of Accident Investigation and Prevention (AVP) is the principal organization within the FAA with respect to aircraft accident investigation and all activities related to the NTSB. The AVP mission is to continuously improve safety by collaboratively developing safety enhancements with the FAA and the aviation community based on the identification of hazards, evaluation of risk, and monitoring of the effectiveness of risk mitigations. AVP is the organization that manages aviation safety management activities both within the FAA and the U.S., and is also responsible for assuring U.S. compliance with the intent of ICAO Annex 19.

Office of Airports (ARP)

ARP is responsible for assuring compliance with U.S. obligations under Annex 14, Aerodrome Design and Construction, and Heliports.

ARP provides leadership in planning and developing a safe and efficient national airport system. The office is responsible for all programs related to airport safety and inspections and standards for airport design, construction, and operation (including international harmonization of airport standards). Each year, the office awards approximately $3.5 billion in airport grants and approves passenger facility charge collections estimated at $2 billion. ARP is also responsible for national airport planning and environmental requirements and establishes policies related to airport rates and charges, compliance with grant assurances, and airport privatization.

Office of Security and Hazardous Materials Safety (ASH)

ASH is the FAA organization responsible for the safe transport of hazardous material by air. An organization within ASH, the Office of Hazardous Materials Safety (ADG), is responsible for assuring compliance with U.S. obligations related to Hazardous Materials Safety under the following ICAO Annexes and guidance:

- Annex 6: International Commercial Air Transport – Aeroplanes; International General Aviation – Aeroplanes; and International Operations – Helicopters;
- Annex 18: The Safe Transport of Dangerous Goods by Air;
- Annex 19: Safety Management; and
- ICAO Document: Doc 9284, AN/905, Technical Instructions for the Safe Transport of Dangerous Goods by Air.

Coordination Within the FAA

Although the different organizations within the FAA have distinct oversight roles, they also work together to achieve objectives of the FAA SMS and Risk-Based Decision Making Strategic Initiative, one of the Administrator's four Strategic Initiatives.[23]

FAA Safety Management System (SMS)

To support its mission to provide the safest, most efficient aerospace system in the world, the FAA is implementing an SMS to systematically integrate the management of safety risk into business planning, operations, and decision making. The FAA SMS leverages existing effective FAA practices for safety management.

[23] FAA Strategic Initiatives Summary: http://www.faa.gov/about/plans_reports/media/FAA_Strategic_Initiatives_Summary.pdf. Accessed on September 17, 2014.

ICAO has established frameworks for SSP, which is applicable to Member States, and SMS, which is applicable to product/service provider organizations. Because the FAA includes both regulatory and product/service provider organizations, the FAA is implementing an SMS which will meet most of the tenets of both the ICAO SSP and SMS frameworks. Meeting the tenets of both the SSP and the SMS frameworks within the FAA's purview ensures interoperability among the SMSs in FAA organizations.

FAA Order 8000.369A, *Safety Management System*[24], governs how FAA LOBs and Staff Offices implement their own SMSs into the overall FAA SMS, and thereby meet the ICAO SSP framework. The order explains SMS principles and requirements, and standardizes terminology for SMS. The order requires FAA organizations to develop implementation or continuous improvement plans for SMS, and requires FAA organizations to establish implementation guidance for their own SMS activities and their industry segment.

The order also established the FAA SMS Executive Council and FAA SMS Committee which are described below.

FAA SMS Executive Council and FAA SMS Committee

The FAA SMS Executive Council is responsible for setting the strategic direction for SMS implementation across the FAA. It provides executive-level guidance and conflict resolution for FAA SMS-related issues. It also approves SMS guidance developed by the FAA SMS Committee. The FAA SMS Committee keeps the Council apprised of SMS activities across the FAA. The Council resolves any issues the FAA SMS Committee raises, which may include disagreements related to Safety Risk Management (SRM). The FAA SMS Executive Council is made up of senior-level management personnel including the Assistant Administrators of the Office of the Next Generation Air Transportation System (ANG), ASH, and the Office of Finance and Management (AFN); Associate Administrators of ARP, Office of Commercial Space Transportation (AST), and AVS; and the ATO Chief Operating Officer.

The FAA SMS Committee provides assistance to FAA organizations for SMS implementation and planning. It meets at regular intervals and at the discretion of the committee chairperson to exchange SMS information. The FAA SMS Committee serves as a forum for discussion of safety policy, SRM, safety assurance, and safety promotion across all FAA member organizations. The FAA SMS Committee includes safety professionals from each FAA organization implementing SMS (ATO, AVS, ARP, AST, ANG, and ASH) and other organizations (such as AFS) as necessary.

The FAA SMS Executive Council and the FAA SMS Committee are responsible for the overall management of the SSP.

FAA Risk-Based Decision Making – Administrator's Strategic Initiative

The Risk-Based Decision Making Initiative is one of four strategic initiatives identified by the FAA Administrator in 2014 as top priorities over the next five years. Through this initiative, the FAA will build on safety management principles to proactively address emerging safety risk by using consistent, data-informed approaches to make smarter, system-level, risk-based decisions.

[24] FAA Order 8000.369A, *Safety Management System*, published May 8, 2013: http://www.faa.gov/documentLibrary/media/Order/8000.369A.pdf. Accessed September 17, 2014.

The Risk-Based Decision Making Initiative is supported by sub-initiatives and activities that are focused on ensuring that decision makers have the necessary information regarding safety risk to make well-informed decisions. Specifically, one sub-initiative focuses on data with underlying activities necessary to increase data collection, sharing, and analysis to support decision makers. Another sub-initiative focuses on ensuring that the FAA has the processes and tools to develop the necessary information to support decision makers and make safety-informed decisions. This sub-initiative will also ensure that the information is properly aligned with and incorporated into FAA governance structures and processes through which decisions are made. The final sub-initiative is focused on the oversight model and implementation of SMS in industry. This sub-initiative will complete the picture to ensure that FAA decisions impacting industry are made with safety risk fully considered and that oversight models are properly aligned with SMSs in industry organizations.

1.2.3 National Transportation Safety Board (NTSB)

The National Transportation Safety Board is an independent Federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine and pipeline. The NTSB determines the probable cause of the accidents and issues safety recommendations aimed at preventing future accidents.

The NTSB is also responsible for maintaining the U.S. database of civil aviation accidents, and it conducts special studies of transportation safety issues of national significance. The NTSB further serves as the "court of appeals" for FAA certificate holders whenever certificate action is taken by the FAA or when civil penalties are assessed by the FAA. The NTSB is not part of the DOT, nor is it affiliated with any of its modal administrations (such as the FAA). The Board derives its authority from 49 USC Chapter 11. The 49 USC provides the NTSB and its investigators with the necessary authority to carry out investigations, including control of the wreckage and accident sites, entry into and inspection of any relevant facility, conduct of any relevant testing or examination, and interview of witnesses.[25]

The NTSB is the government agency charged with the responsibility for assuring compliance with U.S. obligations under ICAO Annex 13, Aircraft Accident and Incident Investigation.

NTSB Office of Aviation Safety

The Office of Aviation Safety within NTSB is responsible for conducting the aviation accident investigation and reporting activities mentioned above. It investigates and reports on all accidents involving U.S. air carrier, commuter, air taxi, and general aviation aircraft, as well as certain accidents involving public use (government) aircraft. It also investigates accidents involving both civilian and military aircraft. Additionally, the NTSB Office of Aviation Safety conducts investigations of safety issues that extend beyond a single accident to examine specific aviation safety problems from a broader perspective.

In conjunction with other offices within the NTSB, the office also works to formulate recommendations to prevent the recurrence of similar accidents and incidents, and to otherwise improve aviation safety. The Office of Aviation Safety includes a number of regional offices spread throughout the U.S. to ensure that NTSB personnel are within closer proximity to potential accident sites.[26]

[25] Additional Information on 49 USC Chapter 11: http://www.ntsb.gov/legal/ntsb_statute.html. Accessed September 17, 2014.
[26] NTSB Office of Aviation website: https://www.ntsb.gov/about/office_as.html. Accessed September 17, 2014.

1.2.4 Coordination Within the U.S. Aviation Safety System

In addition to the legislative and organizational structures that identify agency responsibilities and accountabilities, there are a number of inter-agency links, relationships, and activities that ensure that the U.S. has a cohesive and collaborative aviation safety system.

U.S. SSP Governance

The U.S. identified, defined, and documented the requirements, responsibilities, and accountabilities regarding the establishment and maintenance of the SSP within this document. This includes the directives to plan, organize, develop, maintain, control, and continuously improve the SSP in a manner that meets U.S. safety objectives.

While multiple U.S. government agencies contribute to the U.S. SSP, this document focuses on the roles of the FAA and the NTSB, because those two organizations fulfill the majority of SSP related functions for the U.S.

The U.S. SSP Responsible Executive is the FAA Administrator. The FAA Associate Administrator for Aviation Safety (AVS-1) will administrate and coordinate the implementation and operation of the SSP. AVS-1 will leverage the FAA SMS Executive Council and FAA SMS Committee to carry out the responsibilities of managing the U.S. SSP.

FAA SMS Executive Council

The FAA SMS Executive Council is an existing group responsible for implementing the FAA SMS. The council is authorized by the FAA Administrator, chaired by AVS-1, and is made up of senior-level FAA management personnel including the Assistant Administrators of ANG, ASH and AFN; Associate Administrators of ARP, AST, and AVS; and the ATO Chief Operating Officer.

The Council is charged with carrying out SSP responsibilities to:

- Assure continuous safe operation of the U.S. aviation system;
- Approve U.S. SSP policy prior to agency signature(s);
- Execute U.S. SSP policy within their respective organizations;
- Agree on roles, responsibilities, and relationships between U.S. SSP organizations;
- Agree on activities/accountability for all relevant state organizations;
- Coordinate the U.S. SSP among state organizations, as appropriate;
- Promote the U.S. SSP document within their respective organizations; and
- Commit to continuously improving the U.S. SSP and review it at least every three years to ensure it reflects evolving aviation safety standards and practices.

The FAA SMS Executive Council is responsible for the development and continuing maintenance of the SSP document and for monitoring and reporting on SSP implementation and the indicators relating to levels of safety in the U.S. aviation system. Although the FAA SMS Executive Council is ultimately responsible for the definition, implementation, and continuous improvement of the SSP, it delegates day-to-day management of the SSP to AVS-1 and the FAA SMS Committee.

The FAA regularly communicates with the NTSB, through its established relationships and processes, to ensure that SSP activities are coordinated as necessary.

The FAA Administrator has ultimate control of all resources provided to all of the representatives on the council. The NTSB and FAA have agreements in place that established the terms for which FAA services are provided to the NTSB.

FAA SMS Committee
The FAA SMS Committee is authorized by AVS-1, chaired by the Manager of the Safety Management and Research Planning Division in the Office of Accident Investigation and Prevention in AVS (AVP-300), and coordinated with relevant organizations within the FAA and NTSB. Membership includes safety professionals from AVS, ARP, ATO, ANG, AST, and ASH.

The committee works with the Responsible Executive and the various organizations to manage the SSP activities. The FAA regularly communicates with the NTSB, through its established relationships and processes, to ensure SSP activities are coordinated as necessary.

The committee is also responsible for defining and documenting implementation and subsequent continuing operation of the SSP. The SSP documentation includes this top-level U.S. SSP document that defines/describes the U.S. SSP. Further documentation, such as other records, forms, and Standard Operating Procedures (SOP) associated with SSP implementation and operation will be developed as the SSP evolves.

Inter-Agency Coordination Activities
In addition to U.S. SSP coordination activities, the U.S. engages in other mechanisms of inter-agency safety management related coordination, described below.

Joint Planning and Development Office (JPDO) SMS Standard
The JPDO partner agencies adopted a common SMS Standard in 2008 and agreed to implement it within their respective agencies. The development of the Standard was a government/industry joint effort and participating agencies include: the FAA, NASA, the Departments of Transportation, Defense, Homeland Security, and Commerce, and the White House Office of Science and Technology Policy.

DOT SMS Guidance Document
On August 9, 2011, the Secretary of Transportation issued guidance for the DOT to use SMS principles in overseeing the safety activities of the transportation community by each of the Department's Operating Administrations. The Secretary recognized that actively promoting SMS and a safety culture within the transportation community and with users of the transportation system is a next step in making the U.S. transportation system safer. Implementing SMS concepts within DOT Operating Administrations demonstrates commitment to establishing a safety culture, holds DOT accountable, helps measure performance, and enables communications with DOT partners on the advantages of using SMS concepts in improving the safety of the transportation system.

Interagency Group on International Aviation (IGIA)
IGIA was established by an Interagency Agreement in 1960 at the direction of the President to provide coordinated recommendations on international aviation matters to the Department of State. Upon establishment of the DOT (EO 11382 dated November 28, 1967, Sec. 7), the IGIA functions vested in the FAA Administrator were transferred to the Secretary of Transportation.[27] The DOT utilizes IGIA to obtain the views of participating departments and agencies on international aviation matters requiring government decision or policy direction, when two or more agencies other than the Department of State are affected. In addition, DOT assures that the Secretary of State is provided with recommendations on policy directives and technical or other instructions for the guidance of U.S. representatives to ICAO and other international

[27] EO 11382: https://www.fas.org/irp/offdocs/eo/eo-11382.htm. Accessed September 17, 2014.

bodies concerned with aviation, and U.S. delegations to international conferences in this field, after obtaining the recommendations of the agencies represented on IGIA. The Secretary of State is provided agreed upon recommendations and dissenting views of any substantially affected agency.

Interagency Committee for Aviation Policy (ICAP)

Federally owned aircraft is one of the nation's most valuable assets. To support the government's vision for modernization and progress, the U.S. General Services Administration (GSA) provides the federal aviation community with strong guidance and regulation, and encourages agencies to effectively acquire, manage, and dispose of aircraft. In support of those goals, GSA established ICAP to promote sound policy and foster the highest aviation standards. The ICAP is composed of aviation leaders from across the government who coordinate and advise GSA on developing robust policy. GSA provides a leadership role by chairing the committee, providing programs to support aviation activities, and collecting and reporting data related to federal aviation management.[28]

Members of the committee include:

- Department of Agriculture
- Department of Commerce
- Department of Defense
- Department of Energy
- Department of Health and Human Services
- Department of Homeland Security
- Department of Justice
- Department of State
- Department of the Interior
- Department of the Treasury
- Department of Transportation
- Department of Veterans Affairs
- Environmental Protection Agency
- General Services Administration
- National Aeronautics and Space Administration
- National Science Foundation
- Office of Management and Budget
- Tennessee Valley Authority

Coordination through Memoranda of Understanding (MOU)

The U.S. coordinates a range of aviation safety management issues between agencies through MOUs, which aim to ensure that responsibilities and communication protocols are clearly articulated between relevant agencies. For example, although the relationship between DOT and NTSB was established by legislation, the organizations created agreements to lay out specific relationships, notification procedures, coordination requirements, and reporting responsibilities for both the Board and the Department for accident investigations. The agreements also identify and describe the conditions and agreements that exist between the two organizations regarding data exchange, availability of resources, conduct of studies and other services, and reimbursement for services rendered by either party. Other examples of uses of MOU agreements include DHS and U.S. Coast Guard search and rescue coordination, and the Department of Defense (DoD)/ATO coordination on military/civil air traffic management.

[28] Additional ICAP information can be found at http://www.gsa.gov/portal/category/21234. Accessed September 17, 2014.

1.3 Accident and Incident Investigation

The U.S. currently possesses independent, robust, and mature accident and incident investigation capabilities. The NTSB was established in 1967 to conduct independent investigations of all civil aviation accidents in the U.S. and major accidents in the other modes of transportation. Congress made the NTSB an independent board by passing the Independent Safety Board Act of 1974 (49 USCA app. § 1901 [1982]). The act gave the NTSB sole responsibility for investigating airline crashes. The NTSB mission is to determine the probable cause of major transportation accidents and make safety recommendations so that they do not reoccur.

The NTSB has no regulatory or enforcement powers. To ensure that NTSB investigations focus only on improving transportation safety, its analysis of factual information and its determination of probable cause cannot be entered as evidence in a court of law. NTSB reports are intended to be used to prevent future accidents from occurring, and therefore they are released to the public.[29]

The relationship between the NTSB and the FAA is well established in 49 USC Chapter 11 Section 1131, General Authority,[30] and Section 1132, Civil Aircraft Accident Investigations.[31] The NTSB and FAA have a common objective to promote safety in aviation and prevent aircraft accidents within the scope of their respective statutory responsibilities. When accidents occur, the FAA participates in the NTSB investigation to learn what accident prevention actions it should initiate to prevent a recurrence of similar accidents and to provide technical support to the NTSB. The NTSB has jurisdiction to investigate accidents to determine probable cause and to make recommendations to reduce the likelihood of recurrences of similar accidents.

It is FAA policy to give timely attention and full consideration to all NTSB safety recommendations. The NTSB safety recommendation responses are prepared on a priority basis and are responded to formally, in writing, within 90 days of receipt (those deemed urgent are addressed sooner). NTSB safety recommendations are coordinated fully with each affected organizational element before a substantive reply is made to the NTSB. NTSB safety recommendations are considered active and subject to priority attention until appropriate action is completed and the safety recommendations are classified as “closed” by the NTSB.[32]

1.4 Enforcement Policy

The FAA’s central mission is to promote safety in civil aviation. To achieve this, the agency establishes regulatory standards and requirements, found in 14 CFR parts 1-199 under the statutory authority in 49 USC subtitle VII[33]. Under 49 USC § 40113, the FAA Administrator has broad authority to take action the Administrator considers necessary to carry out his or her statutory responsibilities and powers relating to safety in air commerce, including conducting investigations; prescribing regulations, standards, and procedures; and issuing orders.[34] The FAA also establishes regulatory standards and requirements governing commercial space

[29] NTSB Reports are searchable on the NTSB website: http://www.ntsb.gov/aviationquery/. Accessed September 17, 2014.
[30] 49 USC Chapter 11 Section 1131, General Authority: http://www.gpo.gov/fdsys/pkg/USCODE-2009-title49/pdf/USCODE-2009-title49-subtitleII-chap11-subchapIII-sec1131.pdf. Accessed September 17, 2014.
[31] 49 USC Chapter 11 Section 1132, Civil Aircraft Accident Investigations: http://www.gpo.gov/fdsys/pkg/USCODE-2009-title49/pdf/USCODE-2009-title49-subtitleII-chap11-subchapIII-sec1132.pdf. Accessed September 17, 2014.
[32] FAA Order 1220.2G, *FAA Procedures for Handling National Transportation Safety Board Recommendations*: https://www.faa.gov/documentLibrary/media/Order/1220.2G.pdf. Accessed September 17, 2014.
[33] 49 USC subtitle VII: http://www.gpo.gov/fdsys/pkg/USCODE-2009-title49/pdf/USCODE-2009-title49-subtitleVII.pdf. Accessed September 17, 2014.
[34] 49 USC. § 40113: http://www.gpo.gov/fdsys/pkg/USCODE-2011-title49/pdf/USCODE-2011-title49-subtitleVII-partA-subparti-chap401-sec40113.pdf. Accessed September 17, 2014.

transportation, found in 14 CFR chapter III[35] under the statutory authority in 49 USC subtitle IX, which the Secretary of Transportation delegated to the FAA.[36] In addition, the Secretary delegated the FAA Administrator authority to investigate violations and enforce the DOT Hazardous Materials rules, 49 CFR parts 100-185. When regulations are established, corresponding enforcement policies are also put in place.

Aviation product/service providers have the legal and functional primary responsibility for the safety of their products and services; they must be in compliance with safety regulations and standards established by the FAA. Aviation product/service providers control resources and activities of people directly exposed to hazards and are in a position to directly control the risk related to those hazards. When there is an issue with product/service provider noncompliance with statutory and regulatory requirements, the FAA's Compliance and Enforcement Program is used to pursue corrective action.

1.4.1 FAA Compliance and Enforcement Program[37]

The FAA Compliance and Enforcement Program is designed to promote compliance with statutory and regulatory requirements and is applicable to all activities regulated or enforced by the FAA. The program provides a wide range of options for addressing noncompliance. These options include:

- Educational and remedial training efforts;
- Administrative action in the form of either a warning notice or letter of correction;
- Certificate suspensions for a fixed period of time;
- Civil penalties;
- Indefinite certificate suspensions pending compliance or demonstration of qualifications;
- Certificate revocations;
- Injunctions; and
- Referrals for criminal prosecution.

When violations occur, whether they involve operating an airport; producing aircraft, products, or parts; performing aircraft maintenance; operating aircraft; or accepting for transport or transporting hazardous materials, FAA enforcement personnel must take the action most appropriate to promote safety and compliance with the regulations. The initial priority of FAA investigative personnel is to correct any ongoing noncompliance. FAA personnel then determine what action to take by evaluating, among other things, the seriousness and safety risk imposed by the noncompliance.

Elements of the FAA Compliance and Enforcement Program also seek to promote safety and greater compliance by encouraging regulated entities to disclose their own violations and the circumstances surrounding those violations. Based on information provided through such disclosures, the agency's compliance and enforcement program fosters the implementation of permanent corrective measures to improve overall safety.

FAA enforcement personnel take compliance and enforcement action to prevent future actions that would violate the regulations (e.g., immediate corrective action after counseling or a letter of

[35] 14 CFR chapter III: http://www.gpo.gov/fdsys/pkg/CFR-2004-title14-vol4/pdf/CFR-2004-title14-vol4-chapIII.pdf. Accessed September 17, 2014.
[36] 49 USC subtitle IX: http://www.gpo.gov/fdsys/pkg/USCODE-2011-title49/pdf/USCODE-2011-title49-subtitleIX.pdf. Accessed September 17, 2014.
[37] FAA Order 2150.3B, *FAA Compliance and Enforcement Program*: http://www.faa.gov/documentLibrary/media/Order/2150.3%20B%20W-Chg%204.pdf. Accessed September 17, 2014.

correction, cease and desist orders, injunctions). They also take enforcement actions for remedial purposes (e.g., administrative remedial training, immediate corrective action and comprehensive fixes under the voluntary disclosure reporting programs, certificate suspension pending demonstration of qualifications, or revocation for lack of qualification or competency). They also take enforcement actions to deter future violations by the subject of the enforcement action and those similarly situated (e.g., punitive certificate actions, civil penalties).

Enforcement case priorities focus agency enforcement efforts on those violations that have the greatest safety impact. The agency's highest priorities among enforcement cases are emergency actions, and generally those that involve certificate holder qualifications. Following those cases, the agency's priority enforcement actions are those types of cases identified by program offices as warranting aggressive, swift prosecution.[38] Some matters within the investigatory jurisdiction of the FAA may also involve violations of statutes or regulations that are within the investigatory jurisdiction of another government agency, and in those cases the FAA coordinates accordingly.[39]

The public has a legitimate interest in the FAA's enforcement program and a general right to obtain records of the FAA's enforcement actions, subject to established privileges and exceptions from required disclosure under the Freedom of Information Act (FOIA)[40] and the Privacy Act.[41] The FAA publishes quarterly, a compilation of enforcement actions against regulated aviation entities that are closed with either a civil penalty or issuance of a certificate suspension or revocation. The compilation is based on data from the agency's Enforcement Information System (EIS). For purposes of these compilations, a regulated aviation entity holds a certificate issued by the FAA, (e.g., air carrier operating certificate, repair station certificate, pilot school certificate, airport operating certificate) or is a foreign air carrier or other aviation entity regulated under 14 CFR part 129, Operations: Foreign Air Carriers and Foreign Operators of U.S.-Registered Aircraft Engaged in Common Carriage.[42]

1.4.2 Voluntary Programs

The threat to regulated persons of incurring punitive legal enforcement actions is a traditional and often effective incentive to promote compliance. While these actions have deterrent value, they do not necessarily improve the ability to assure future compliance. The public interest in aviation safety is served in appropriate circumstances by positive incentives to promote and achieve compliance. To this end, the FAA established several programs to improve compliance and increase safety by offering incentives to regulated entities to disclose their own violations, other safety discrepancies, and general safety information to the FAA and take corrective action to preclude future safety problems, if appropriate. Examples of such programs include the Voluntary Disclosure Reporting Programs (VDRP), Aviation Safety Action Programs (ASAP), the Flight Operational Quality Assurance (FOQA) programs, and the Aviation Safety Reporting System (ASRS).[43]

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[38] Public Law (PL) 103-272, Re-codified Federal Aviation Act of 1958), subpart IV

[39] A provision for coordination with agencies outside of FAA is discussed in Chapter 3 Section 6 of FAA Order 2150.3B, *FAA Compliance and Enforcement Program*

[40] FOIA website: http://www.foia.gov/about.html. Accessed September 17, 2014.

[41] Additional information on the Privacy Act can be found on the U.S. Department of Justice website: http://www.justice.gov/opcl/1974privacyact-overview.htm. Accessed September 17, 2014.

[42] The Transportation Security Administration (TSA) is now the record owner for all enforcement actions ever taken against regulated aviation entities for violations of chapter 449 of 49 USC or a regulation prescribed or an order issued thereunder. The FAA, therefore, will no longer include within the quarterly compilations, closed enforcement actions against entities for violations of such requirements. The FAA has removed such security enforcement actions from all quarterly compilations presently posted on the FAA web site. Information about such enforcement actions must be sought from the TSA.

[43] Additional information regarding voluntary disclosure of violations is discussed in Chapter 5 Section 7 of FAA Order 2150.3B, *FAA Compliance and Enforcement Program*

The regulation for protection of data submitted voluntarily is established in 14 CFR part 193, Protection of Voluntarily Submitted Information. Certain information, which might otherwise be disclosed, is prohibited from disclosure if it is protected by an order issued under 14 CFR part 193.[44] FAA Order 8000.81 designates information provided to the FAA from an approved FOQA program as protected under 14 CFR part 193. Except for criminal and deliberate acts, the FAA may not use an operator's FOQA data in an enforcement action against that operator or its employees when that data is obtained from an FAA-approved FOQA program. FAA Order 8000.82 designates information provided to the FAA from an ASAP program as protected under 14 CFR part 193. FAA Order 8000.89 designates information provided to the FAA from a VDRP program as protected under 14 CFR part 193.[45]

Voluntary reporting programs are described further in Section 3.2, *Safety Data Collection, Analysis, and Exchange*.

1.4.3 AOV Enforcement of ANSP (ATO) SMS Policy

The FAA is unique in that it contains both regulatory and service provider organizations. The FAA ATO provides air navigation service in the U.S. aerospace system. Another organization, AOV within AVS, oversees the ATO, as established in FAA Order 1100.161, *Air Traffic Safety Oversight*.[46] AOV has the authority to issue Warning Notices, and Safety Directives (SD) requiring ATO to make a change, stop a procedure, or alter a practice where there is a safety concern that warrants such an action. AOV also can issue Letters of Correction when procedures and/or practices are brought into compliance. Further information regarding AOV Enforcement of ATO SMS Policy is contained in AOV SOC 13-13, *Corrective Action Plan Development and Acceptance in Response to Safety Compliance Issues*.

[44] 14 CFR part 193: http://www.gpo.gov/fdsys/pkg/CFR-2012-title14-vol3/pdf/CFR-2012-title14-vol3-part193.pdf. Accessed September 17,

[45] FAA Order 8000.81, *Designation of Flight Operational Quality Assurance (FOQA) Information as Protected from Public Disclosure under 14 CFR part 193*: http://www.faa.gov/documentLibrary/media/Order/8000.81.pdf. Accessed September 17, 2014.
FAA Order 8000.82, *Designation of Aviation Safety Action Program (ASAP) Information as Protected from Public Disclosure Under 14 CFR part 193*:
http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgOrders.nsf/0/3bede9f5973e6dfa86256d9b005790cb/$FILE/Order8000.82.pdf. Accessed September17, 2014.
FAA Order 8000.89, *Designation of Voluntary Disclosure Reporting Program (VDRP) Information as Protected from Public Disclosure under 14 CFR part 193*: http://www.faa.gov/documentLibrary/media/Order/ND/8000_89.pdf. Accessed September 17, 2014.

[46] FAA Order 1100.161, *Air Traffic Safety Oversight*:
http://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.information/documentID/14251. Accessed September 17, 2014.

U.S. safety entities have many processes and systems in place that have created a safe and efficient aviation system. To achieve the next level of safety, the U.S. must augment its traditional methods of analyzing the causes of an accident or incident after the fact by adopting tools and metrics to further anticipate potential sources of risk. This will allow the U.S. to identify and address accident precursors and contributors, and strategically manage safety resources for maximum safety improvement in a cost effective manner. The FAA SMS enables the U.S. to manage safety risk in the aviation system.

2.1 Safety Requirements for Service Provider's SMS

The U.S. recognizes the requirement for States to establish regulations requiring service providers to implement SMS; however, the U.S. filed a difference due to the complexity of the U.S. rulemaking process and the burden of showing that benefits to the public outweigh costs of implementation.

In accordance with ICAO Annex 19 standards, the U.S., through AOV, has in place SMS requirements for the U.S. ANSP, the ATO. Additionally, on January 8, 2015, the FAA issued a final rule requiring each air carrier operating under 14 CFR part 121 to develop and implement an SMS to improve the safety of its aviation-related activities.[47] Currently, there are no regulations in place requiring the implementation of SMS by:

- Approved training organizations that are exposed to safety risk related to aircraft operations during the provision of their services;
- Operators of airplanes or helicopters, other than 14 CFR part 121 certificate holders, authorized to conduct international commercial air transport;[48]
- Approved maintenance organizations providing services to operators of airplanes or helicopters engaged in international commercial air transport;
- Organizations responsible for the type design or manufacture of aircraft; or
- Airports certified in accordance with Annex 14.

The FAA issued a Notice of Proposed Rulemaking (NPRM) proposing regulation that would require 14 CFR part 139, Certification of Airports, airports to establish safety management systems; however, the rulemaking process is ongoing. Additionally, an Aviation Rulemaking Committee (ARC) was established for 14 CFR part 21, Certification Procedures for Products and Parts, and part of the committee's purpose is to assess the application of SMS to 14 CFR 21 certificate holders. While no additional rulemaking activities have been specifically planned, rulemaking will be considered for additional parts. When rulemaking is not feasible due to the complex U.S. regulatory structure, the FAA plans to establish formal voluntary SMS programs to cover the additional components of the aviation system. The FAA conducted voluntary SMS pilot projects with airport operators and aircraft design and manufacturers to study the implementation of SMS in these segments. In addition, AFS has an ongoing voluntary pilot project that includes among others: air carriers (14 CFR part 135, Operating Requirements:

[47] Safety Management Systems for Domestic, Flag, and Supplemental Operations Certificate Holders – Final Rule issued January 8, 2015: https://www.federalregister.gov/articles/2015/01/08/2015-00143/safety-management-systems-for-domestic-flag-and-supplemental-operations-certificate-holders. Accessed January 14, 2015.

[48] This includes operators of airplanes or helicopters authorized to conduct the carriage of Dangerous Goods in accordance with Annex 18, the Safe Transport of Dangerous Goods by Air.

Commuter and On Demand Operations and Rules Governing Persons on Board Such Aircraft, certificate holders) and repair stations (14 CFR part 145 certificate holders).

2.1.1 Air Traffic Organization (ATO) SMS

The U.S. air traffic control provider, the ATO, is part of the FAA. Through the publication of FAA Order 1100.161, *Air Traffic Safety Oversight,* the FAA established AOV to oversee the ATO. FAA Order 1100.161 also requires the ATO to implement an SMS.[49] AOV certified the ATO SMS in March 2010.

The U.S., via AOV, established standards which govern how the ATO identifies hazards and manages safety risk. These standards include the requirements, specific operating regulations, and implementation policies for the ATO SMS. They are periodically reviewed to ensure that they remain relevant and appropriate to the ATO. FAA JO 1000.37, *Air Traffic Organization Safety Management System,*[50] the *ATO Safety Management System Manual,*[51] and related guidance (e.g., Safety Risk Management Guidance for System Acquisitions) are reviewed periodically to ensure relevancy to the ATO.

The ATO is working on continuous improvement of its SMS and published Version 4.0 of its *Safety Management System Manual* on September 1, 2014.

2.1.2 Proposed Rulemaking

The U.S. has activities underway to establish SMS requirements for specific certificate holders in the U.S. aviation industry. These activities are described below.

Airports

The FAA established a rulemaking project under FAA-2010-0997 to publish requirements for SMS at U.S. airports. This rulemaking would establish which U.S. airports certificated under 14 CFR part 139 will be required to implement an SMS. Publication of this rule will meet part of the U.S.'s obligation to establish SMS requirements for organizations covered under ICAO Annex 14.

Aircraft Design and Manufacturing

A 14 CFR part 21 ARC was established in 2012 to provide a forum for the U.S. aviation community to discuss and provide recommendations to the FAA. The committee provided general information and guidance regarding proposed changes to 14 CFR part 21 and the FAA SMS as it relates to design and manufacturing (D&M) certificate and approval holders. Specifically, the ARC analyzed and explored proposals for rulemaking, suggested processes, policies, and guidance the agency should contemplate for applying SMS to 14 CFR part 21 certificate holders. 14 CFR part 21 covers products and parts (i.e., design and manufacture of aircraft and aircraft parts). Therefore, publication of a rule applicable to 14 CFR part 21 should meet part of the U.S. obligation to establish SMS requirements for organizations covered under Annex 8. The FAA is currently exploring the application of SMS to 14 CFR part 21 through the ARC. ARC recommendations are undergoing the final review process and will be released in the near term.

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[49] FAA Order 1100.161, *Air Traffic Safety Oversight*: http://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.information/documentID/14251. Accessed September 17, 2014.
[50] FAA JO 1000.37, *Air Traffic Organization Safety Management System*, published March 19, 2007: http://www.faa.gov/documentLibrary/media/Order/ND/1000.37.pdf. Accessed September 17, 2014.
[51] *ATO Safety Management System Manual Version 4.0*, effective September 1, 2014: http://www.faa.gov/air_traffic/publications/media/faa_ato_SMS_manual_v4_20140901.pdf. Accessed September 11, 2014.

2.1.3 Voluntary SMS Pilot Projects

Regulations may not always be feasible and other mechanisms to meet the intent of Annex 19 may be necessary.

Although regulation is not in place for various CFR parts, the development of processes to oversee SMSs of product/service providers outside the FAA began with voluntary SMS pilot projects. These pilot projects have been in place for several years and have been quite successful. Participation in the SMS pilot projects positions industry organizations for easier transition to SMS.

The FAA conducted voluntary SMS pilot projects with airport operators and aircraft design and manufacturers. In addition, AFS has an ongoing voluntary pilot project that includes participation from various types of service providers overseen by AFS. SMS pilot projects offer industry participants broad experience in the development of an SMS, input to FAA guidance under development, and an opportunity to share best practices and lessons learned. In addition, they provide a practical environment in which the FAA can revise or develop additional processes to oversee product/service providers that are implementing or have implemented an SMS. Until regulations are in place, or cases in which regulations are not feasible, these organizations can apply what was learned from the pilot projects while transitioning to voluntary programs. The pilot projects are described in more detail below.

Flight Standards SMS Pilot Projects

AFS is conducting voluntary SMS pilot projects specifically for operators and service providers. The SMS pilot project objectives are to develop implementation strategies and oversight interfaces, and for both AFS and service providers to gain experience with SMS. The SMS Focus Group (SMSFG) is a voluntary implementation users group that provides two-way communication between the AFS SMS Program Office and participants in voluntary implementation. It also provides a forum for knowledge sharing among participants. SMSFG meetings are scheduled annually and offer a forum for SMS pilot project participants to share information and lessons learned with each other and the AFS SMS Program Office.

AFS published several documents to assist pilot project participants, including AC 120-92A, *Safety Management Systems for Aviation Service Providers*, which provides a framework for SMS development by aviation service providers.[52] It contains a uniform set of expectations that aligns with the structure and format of the ICAO SMS Framework. AFS created additional guidance documents that support the AC. Appendix 1 of AC 120-92A, *Safety Management System (SMS) Framework*, provides aviation industry organizations with a standard set of concepts, documents, and tools for the voluntary development and implementation of SMS. The appendix also makes SMS implementation standards consistent with AVS policy and assists participants in conforming with future rules.

AFS also created a *Safety Management System (SMS) Assurance Guide* and a *Safety Management System (SMS) Implementation Guide*,[53] which contain guidance, expectations, and procedures necessary to implement an SMS. These guides provide a multi-level recognition system to acknowledge an organization's participation in the SMS pilot project and associated development of its SMS in relation to FAA expectations and international standards. AFS plans

[52] AC 120-92A, *Safety Management Systems for Aviation Service Providers*, published August 12, 2010: http://www.faa.gov/documentLibrary/media/Advisory_Circular/AC%20120-92A.pdf. Accessed September 17, 2014.
[53] *Safety Management System (SMS) Implementation Guide,* published June 1, 2010: https://www.faa.gov/about/initiatives/sms/specifics_by_aviation_industry_type/air_operators/media/sms_implementation_guide.pdf. Accessed September 17, 2014.

to update the *FAA AFS SMS Guidebook* as a supplement to the SMS pilot program guidance material. The guidebook is a future state document and will be the repository for expanded guidance, detailed instructions, and best practices for use in the implementation of an SMS for an aviation service provider (e.g., air carrier, maintenance repair organization).

With the publication of 14 CFR part 5, those operators certificated under 14 CFR part 119, Certification: Air Carriers and Commercial Operators, and 14 CFR part 121 will no longer participate in the pilot projects because they are required to have an SMS. However, the pilot project activities will transition to a voluntary program for operators certificated under 14 CFR parts other than 119/121.

Aircraft Certification Manufacturers SMS Pilot Projects

AIR launched an SMS pilot program for D&M organizations, called the Manufacturers Safety Management System (MSMS) pilot project. During the pilot, AIR participated with industry to build an enhanced management system for safety using system safety principles. AIR oversaw the implementation of MSMS within selected design and production approval holder organizations to establish the structure and expectations for D&M SMS implementation. Specifically, AIR wanted to understand, through firsthand experience, how SMS can be applied to a diverse, but representative, set of D&M organizations to achieve full safety benefits and best use of oversight and industry resources.

The MSMS pilot project team created various tools, for industry and the FAA, to use during this learning process. Each of these guidance documents was developed collaboratively by the FAA and industry. *The D&M SMS Pilot Project Guide* served as the primary source of information for pilot project participants and FAA entities involved in the pilot project. This document provides D&M organizations with general information on how to begin developing and implementing an SMS, as well as assists the FAA in evaluating an organization's SMS program and participating in further development of implementation and oversight strategies.

The MSMS pilot project was an industry outreach effort that sought to collect input on potential rulemaking requirements, scalability, applicability, implementation assessment, oversight methods, and tools and guidance as they relate to the D&M domain.

The results of the pilot program are helping AIR to develop oversight processes and tools. Pilot project results are also helping AIR to: establish acceptable levels of safety for D&M organizations and the industry as a whole; use a D&M organization's SRM outputs as inputs to its acceptance/approval of new and modified designs; develop metrics for assessing the performance of an SMS and the effectiveness of risk controls; and complete the methodology to assess a product/service provider SMS and identify potential safety issues. Feedback from pilot project participants will also assist the ARC and any future rulemaking activities that may be pursued to fully implement SMS.

Airports SMS Pilot Projects

As part of its effort to develop and update AC 150/5200-37, *Introduction to Safety Management Systems (SMS) for Airport Operators,* which introduces the concept and offers guidance on SMS for airport operators[54], ARP completed pilot studies to help determine the appropriate scope and detail of that guidance. The pilot studies were designed to encourage and assist airport operators in developing an SMS and allow them to share their experiences and SMS

[54] AC 150/5200-37, *Introduction to Safety Management Systems (SMS) for Airport Operators*: http://www.faa.gov/documentLibrary/media/advisory_circular/150-5200-37/150_5200_37.pdf. Accessed September 17, 2014.

practices with other airports and the FAA. To date, there have been three phases of pilot studies for airports.

Under the first Airport SMS Pilot Study, ARP selected 31 airports to participate, 29 of which received Airport Improvement Program (AIP)[55] grants to develop their SMS Manuals and Implementation Plans. Airports participating in the study were required to follow a Statement of Work and Pilot Study Participant Guide, which detailed the deliverables and time frames for the study. ARP later reopened the study to smaller certificated airports to gather information on scalability and how smaller airports might implement SMS.

In the second phase, ARP selected three airports, varying in size and operational complexity, to conduct a proof-of-concept study. The three airports tested selected components and elements of their SMS Manuals developed during the first phase and reported out on lessons learned, challenges, and strengths.

Finally, in December 2009, the FAA conducted a 14 CFR part 139 SMS Implementation Study. The study examined how airports implement the elements of the SRM and safety assurance components throughout the airfield environment. Eligibility for the study was limited to airports that participated in the first or second studies. 14 airports participated, providing valuable input to the rulemaking and guidance development processes.

2.2 Agreement on Service Provider's Safety Performance

The establishment of service provider safety performance is done through regulation and would be considered as part of the approval of a service provider's SMS. As service providers implement SMS, the FAA, as a regulator, will determine whether a service provider's safety performance indicators and respective target levels are acceptable. The service provider would then evaluate its safety performance against those accepted indicators/targets. The agreed upon safety performance targets would be reviewed periodically to ensure they remain relevant and appropriate to the service providers.

FAA Order 1100.161, *Air Traffic Safety Oversight*, requires the ATO to assess the effectiveness of its SMS in affecting National Airspace System (NAS) safety by collecting, tracking, and analyzing safety data. AOV requires the ATO to measure several reportable air traffic incidents such as losses of standard separation, runway incidents, near mid-air collisions, missed equipment preventative maintenance, and expired equipment certifications:[56]

[55] AIP: http://www.faa.gov/airports/aip/. Accessed September 17, 2014.
[56] FAA Order 1100.161, *Air Traffic Safety Oversight*: http://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.information/documentID/14251. Accessed September 17, 2014.

STATE SAFETY ASSURANCE

Safety oversight based on SMS principles reinforces the responsibility of service providers to focus on safety throughout their organization and operating environment. However, the U.S. government and its aviation agencies retain a critical role in maintaining quality assurance of the broader safety system. This includes safety oversight and data collection, analysis, and exchange.

U.S. aviation agencies collect, analyze, and report on a range of aviation safety data. This data is used within the U.S. safety system to monitor trends in aviation safety and to identify areas where there may be safety issues to be addressed.

3.1 Safety Oversight

Safety assurance in the U.S. is accomplished through mature oversight of service providers spanning all sectors of the aviation industry. Many of the oversight and surveillance programs are data-informed so that resources are focused and prioritized according to areas of highest risk or greatest safety concern.

The U.S. has established mechanisms to ensure the effective monitoring of the Eight Critical Elements of Safety Oversight.[57] The U.S. also possesses robust and mature oversight mechanisms for the various sectors of U.S. industry which is evidenced by results of the ICAO Universal Safety Oversight Audit Programme (USOAP) U.S. aviation system review in 2008. Figure 3 shows the U.S. performing well above global averages in all categories audited in the 2008 USOAP review.[58] The U.S. submitted a corrective action plan (CAP) to ICAO in 2008 to address deficiencies found in the audit. Each individual FAA LOB or U.S. Government Agency is responsible for its own CAP, and all CAPs are coordinated through the FAA Office of International Affairs (API) before submittal to ICAO.

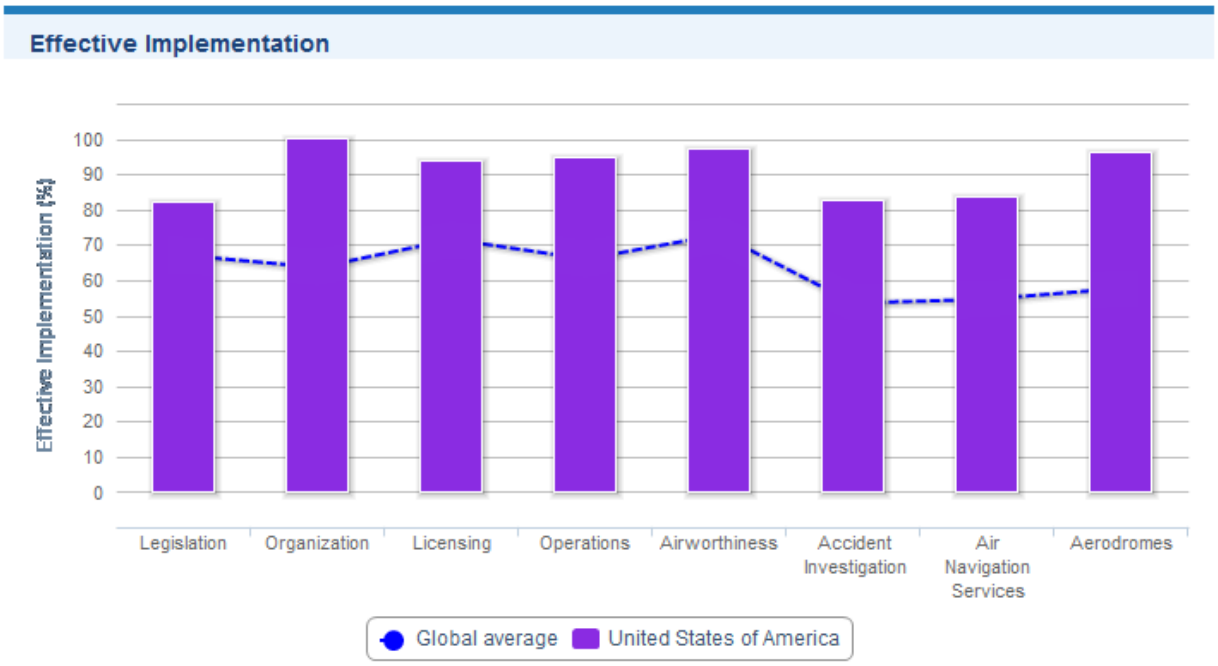
A key USOAP principle is the Continuous Monitoring Approach (CMA), a proactive risk-based approach to monitor the safety oversight capability of a State. The objective of CMA is to promote global aviation safety through continuous monitoring of Member States' safety oversight capabilities. The U.S. is transitioning to using CMA and will submit information on its compliance with Standards and Recommended Practices (SARPs) to ICAO through an online framework. CMA provides a mechanism for ICAO to:

- Collect safety information from Member States and other stakeholders on a real time basis; and
- Analyze the information using a risk-based approach to identify and prioritize appropriate activities to be carried out by ICAO.

[57] The ICAO Eight Critical Elements (CE) of a Safety Oversight Program: CE-1, Primary Aviation Legislation; CE-2, Specific Operating Regulations; CE-3, State Civil Aviation System and Safety Oversight Functions (Organization); CE-4, Technical Personnel Qualification and Training; CE-5, Technical Guidance, Tools, and the Provision of Safety Critical Information; CE-6, Licensing, Certification, Authorization and Approval Obligations; CE-7, Surveillance Obligations; and CE-8, Resolution of Safety Concerns.

[58] USOAP information: http://www.icao.int/safety/CMAForum/Documents/Flyer_US-Letter_ANB-USOAP_2013-08-30.pdf. Accessed September 17, 2014.

Figure 3: U.S. USOAP Review Results - 2008



The FAA will further enhance these processes as it continues moving forward with incorporating safety management principles into its processes and study requirements for the organizations the FAA oversees.

In addition to its certification and licensing functions, the FAA formally monitors service provider operations through inspections, audits, and surveys to ensure that they are meeting regulations and that fulfillment of the requirements has the intended effects. FAA organizations that oversee service providers and their respective surveillance programs are further discussed below.

3.1.1 Aviation Safety Organization (AVS)

AVS is responsible for the certification, production approval, and continued airworthiness of aircraft; the certification of pilots, mechanics, and others in safety-related positions; and the oversight of the ATO. Safety assurance of product/service providers refers to those activities used by AVS to assure providers are meeting their requirements to manage safety risk in their operational systems.

Safety reviews, evaluations, audits, inspections, surveillance, data tracking, data analysis, and investigations are AVS Safety assurance tools. They systematically provide confidence that organizational outputs, regarding design and performance of products and services, meet or exceed safety requirements. Safety assurance ensures compliance with FAA orders, standards, and policies, as well as SMS requirements; it provides insight to opportunities for improving safety and minimizing risk.

Since AVS organizations with oversight responsibility each provide oversight of different product/service providers, their existing methods and future needs in Safety assurance may vary. As SMS implementation progresses, AVS will seek every opportunity to increase safety by improving organizational processes, using tools such as Quality Management System (QMS), such that these organizations can:

- Speak a common language with respect to safety and risk;
- Share safety data/information more easily; and
- Apply common decision-making methodologies to allocate oversight resources based on safety risk.

In addition, AVS oversight activities should align with industry implementation of SMS. As discussed earlier, AFS and AIR have ongoing activities to expand their knowledge base regarding the impact of industry SMS implementation.

Flight Standards Service (AFS)

Since regulatory compliance is the safety benchmark, safety risk controls are assessed through oversight based on existing regulations. AFS assures compliance of regulations through acceptance or approval of certificate holders' operating manuals and/or established programs/procedures, as well as surveillance of the programs and procedures presented in those manuals.

The Air Transportation Oversight System (ATOS) provides processes to oversee 14 CFR part 121 air carriers. It provides for planning, resource management, data collection, analysis, assessment, and action tracking. ATOS also provides a process to target resources according to assessment of safety risk. The Action Determination and Implementation (ADI) process in ATOS includes business processes and software tools to enable analysis and assessment of system performance at both design and performance levels.

Additionally, ATOS has a problem resolution function that employs the risk assessment steps outlined in FAA Order VS 8000.367A, *Aviation Safety (AVS) Safety Management System Requirements*, Chapter 3 (SRM) paragraph 1a-d.[59] Control of risk is the responsibility of the operator (i.e., product/service provider) per 49 USC, Section 44702, Issuance of Certificates.[60] Subsequent to risk assessment, the ATOS risk management module provides for tracking of these air operator actions.

ATOS processes will be enhanced and expanded to include coverage of 14 CFR parts 135 and 145 with the implementation of the Safety Assurance System (SAS). These and other areas of AFS responsibility are currently covered by the *National Flight Standards Work Program Guidelines* (FAA Order 1800.56O).[61] Activities are recorded in the Program Tracking and Recording Subsystem (PTRS). These systems provide for nationally and locally defined standardized surveillance activities. Analysis capabilities are available through the Safety Performance Analysis System (SPAS). While resource management and safety performance decisions are not risk-based, a limited risk-based resource targeting capability is available for some 14 CFR part 135 certificates through the Surveillance Enhancement Program (SEP). Additional risk targeting capabilities are available for 14 CFR part 145 repair station oversight through the Repair Station Assessment Tool (RSAT).

Supporting voluntary programs and processes include external product/service provider data acquisition programs. A few examples are FOQA, ASAP, and Line Operational Safety Audits (LOSA).

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[59] FAA Order VS 8000.367A, *Aviation Safety (AVS) Safety Management System Requirements*, Chapter 3 (SRM) paragraph 1a-d, effective November 30, 2012: http://www.faa.gov/documentlibrary/media/order/faa%20order%208000.367a.pdf. Accessed September 17, 2014.

[60] 49 USC, Section 44702, Issuance of Certificates: http://www.gpo.gov/fdsys/pkg/USCODE-2011-title49/pdf/USCODE-2011-title49-subtitleVII-partA-subpartiii-chap447-sec44702.pdf. Accessed September 17, 2014.

[61] FAA Order 1800.56O, *National Flight Standards Work Program Guidelines*, Accessed September 30, 2014.

FAA Order 8900.1, *Flight Standards Information Management Systems (FSIMS),* describes how aviation safety inspectors (ASI) oversee 14 CFR part 121 carriers. As rules are established, this order will change to reflect the new requirements within the rule.[62]

Aircraft Certification Service (AIR)

For AIR, safety assurance of product/service providers applies to activities related to design approvals, production approvals, and continued airworthiness. The AIR core business functions of Regulation, Certification, and COS work in an integrated fashion. AIR is moving toward risk-based decision making with regards to product/service provider safety assurance by implementing two processes/services—Risk Based Resource Targeting (RBRT) and Monitor Safety/Analyze Data (MSAD).

RBRT provides a structured approach for assessing product/service provider organizational and technical risk to determine AIR resource allocation for:

- Developing rules and policy/guidance documents, and
- Performing certifications (e.g., Type Certificate (TC)/ Amended Type Certification (ATC) / Supplemental Type Certificate (STC), production certificate (PC), Parts Manufacturer Approval (PMA), Technical Standard Order Approval (TSOA)).

RBRT may also be used to support AVS designee management decision making.

MSAD was deployed in support of the AIR COS function. It is used to assess hazards and associated risk indicated by in-service data. Risk analyses are performed, as appropriate, along with associated root-cause analysis to support making recommendations to AIR Corrective Action Review Boards on whether a risk control (e.g., AD, Special Airworthiness Information Bulletin (SAIB)) should be issued for a hazard that has gone through the MSAD process.

Office of Aerospace Medicine (AAM)

AAM oversees aviation product and service providers through a variety of programs focused at the individual and organizational level. Programs designed to provide safety assurance information to support safety oversight include:

- Regulation and oversight of industry drug and alcohol testing programs;
- Medical regulations, standards, policies, and procedures;
- Medical certification and clearance of airmen and other persons associated with safety in flight;
- Designated Aviation Medical Examiner (AME) system;
- Aerospace medical education; and
- FAA employee substance abuse testing programs including the medical review of all positive drug cases involving DOT employees.

AFS and AAM are dependent on each other to share data regarding the safety assurance of many product and service providers. While both AAM and AFS have different safety assurance roles, both organizations recognize the importance of working cooperatively to share safety data. AAM's Civil Aerospace Medical Institute (CAMI) supports safety oversight through aerospace medical research projects, biometric and biostatistical data collection and analysis, and the investigation of aerospace medical and human factors in civil aircraft accident

[62] FAA Order 8900.1, *Flight Standards Information Management Systems (FSIMS),* effective September 13, 2007: http://www.faa.gov/documentLibrary/media/Order/8900.1.pdf. Accessed September 17, 2014.

investigations. AAM also implemented a formal, internal SMS to ensure all safety programs include safety risk management and safety assurance as part of their oversight operations.

Air Traffic Oversight Service (AOV)

Under FAA Order 1100.161, *Air Traffic Safety Oversight*, AOV carries out surveillance, compliance, and verification processes coupled with cooperation with other organizations' safety services. AOV monitors ATO operations to determine compliance with established standards, rules, and directives, particularly the ATO SMS. AOV reviews and approves ATO safety implementation actions and risk control strategies. AOV ensures consistency in the application of requirements by means of credentialing programs for ATO operational personnel and safety audits, inspections, and assessments of ATO operations and system processes.

AOV oversight of the ATO follows a systems safety approach, which is predicated on continuous improvement. It requires systematically capturing and analyzing safety data for trends and hazards, so that decisions and processes having a negative safety impact can be identified, changed, or eliminated.

Accident Investigation and Prevention (AVP)

AVP is involved in the safety assurance of product/service providers as the FAA lead for accident and incident investigation. FAA Order 8020.11, *Aircraft Accident and Incident Notification, Investigation, and Reporting,* includes specific responsibilities regarding safety assurance of product/service providers in accident investigations which include:[63]

- Performance of FAA facilities or functions;
- Performance of non-FAA owned and operated air traffic control (ATC) facilities or navigational aids;
- Airworthiness of FAA-certificated aircraft;
- Competency of FAA-certificated airmen, air agencies, commercial operators, or air carriers;
- Adequacy of Federal Aviation Regulations;
- Airport certification safety standards or operations;
- Hazardous materials;
- Airman medical qualifications; and/or
- Violation of Federal Aviation Regulations.

SMS requires the continued use of accident and incident investigations as a means to identify potential hazards and non-compliances in the aerospace system. Within the AVSSMS, AVP continues to investigate accidents/incidents. In addition, AVP continues to monitor controls through the Aviation Safety Information Analysis and Sharing (ASIAS) program and conduct vulnerability activities (i.e., identification of hazards in the system). These programs may provide insight and early detection of hazards prior to having an accident or incident. Supporting policy and processes include:

- AVP-100-001, *Aircraft Accident and Incident Notification, Investigation and Reporting*
- AVP-200-001, *Aviation Safety Information Analysis and Sharing (ASIAS) Study Process*
- FAA Order 8020.11, *Aircraft Accident and Incident Notification, Investigation, and Reporting*
- FAA Order 1220.2G, *FAA Procedures for Handling National Transportation Safety Board (NTSB) Recommendations*

[63] FAA Order 8020.11 is under revision. The latest published version is FAA Order 8020.11C, *Aircraft Accident and Incident Notification, Investigation, and Reporting*, effective October 4, 2011: http://www.faa.gov/documentLibrary/media/Order/8020.11C%20with%20Chg%201.pdf. Accessed September 30, 2014.

3.1.2 Office of Security and Hazardous Materials Safety (ASH)

The Hazardous Materials Safety Program (HMSP) is responsible for managing the risks to aviation safety posed by the transportation of hazardous materials by air. It oversees U.S. registered passenger and cargo air carriers worldwide, foreign air carriers entering U.S. airspace, and repair stations handling or shipping hazardous materials. Additionally, the HMSP has primary oversight authority over passengers carrying hazmat on board aircraft, and shippers of hazmat by air.

Supporting documentation includes:

- FAA Order 2150.3B, *Compliance and Enforcement Program*
- FAA Order 1650.9A, *Transportation of Hazardous Materials*
- *National Inspection and Investigations Manual (NI2M)*
- *HMSP Aircraft Accident Investigations Manual*
- *National Work Plan*

3.1.3 Office of Airports (ARP)

ARP oversees the certification and safety surveillance of 14 CFR part 139 airports as described in FAA Order 5280.5C, *Airport Certification Program Handbook.*[64] ARP inspectors visit each certificated airport to determine compliance with 14 CFR part 139 in the areas of training, records, self-inspection, airport condition reporting, aircraft rescue and fire fighting, wildlife, markings, signs, lighting, and other areas. ARP also works with ATO and AVS to investigate and track runway incursions and excursions.

ARP is applying safety management principles to its own internal operations. In accordance with FAA standards, the Associate Administrator for Airports published FAA Order 5200.11*, FAA Airports Safety Management System* in August 2010. The order establishes the ARP internal policy and requirements for infusing the components and elements of SMS into areas of oversight, including standards development, planning, and other oversight activities.[65] In June 2012, ARP published the *Office of Airports SMS Desk Reference* to complement the order and give practical guidance on the implementation of SMS throughout the organization.[66] At its core, ARP is now incorporating formalized SRM practices into its oversight and approval processes, which include the approval of Airport Layout Plans and Construction Safety and Phasing Plans and requests for Modification of Standards.

3.1.4 Established Process for Initial Review/Acceptance of Individual SMSs

Where SMSs are being implemented in the aviation industry, the responsible oversight authority established processes for initial review/acceptance of individual SMSs. SMS requirements will be treated like every other service provider responsibility, and the FAA role is to assure service providers meet all requirements. As regulations are established, existing approval processes will be updated or additional ones will be established to ensure that the approval/acceptance process is stated explicitly.

As mentioned earlier, the ATO has a certified SMS, and FAA Order 1100.161, *Air Traffic Safety Oversight*, established the process for its initial review/acceptance. In addition, as discussed

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[64] FAA Order 5280.5C, *Airport Certification Program Handbook*, effective September 8, 2006: http://www.faa.gov/documentLibrary/media/Order/ND/5280.5.pdf. Accessed September 17, 2014.
[65] FAA Order 5200.11*, FAA Airports Safety Management System*, effective July 22, 2013: http://www.faa.gov/documentLibrary/media/Order/order5200_11Consolidated.pdf. Accessed September 17, 2014.
[66] The *Office of Airports SMS Desk Reference*, published June 1, 2012: http://www.faa.gov/airports/airport_safety/safety_management_systems/internal/media/arpSMSDeskRefVer%201_0.pdf. Accessed September 17, 2014.

earlier, certificate holders under 14 CFR part 119 authorized to conduct operations in accordance with the requirements of 14 CFR part 121 are required to have an SMS that meets the requirements of 14 CFR part 5, and is acceptable to the FAA Administrator, by March 9, 2018. These certificate holders must submit an implementation plan to the FAA Administrator for review no later than September 9, 2015. The implementation plan must be approved no later than March 9, 2016.

As discussed in Section 2.1, *Safety Requirements for Service Provider's SMS*, other service providers regulated by the FAA are not yet required to implement SMS, although some are participating in voluntary SMS pilot projects.

3.2 Safety Data Collection, Analysis, and Exchange

The U.S. currently collects aviation safety data from numerous sources including through oversight processes and voluntary reporting programs. This data is analyzed at various levels, including at the national level, and is used to inform decisions regarding AVS oversight activities and safety in the aerospace system.[67] The FAA is enhancing its processes to allow for further exchange and analysis of aviation safety data.

3.2.1 Safety Data Collection

Established reporting mechanisms ensure the capture, storage, and aggregation of data on accidents, incidents, and hazards obtained through mandatory and voluntary reports.

Mandatory Reporting

The FAA and the NTSB have established mechanisms to ensure mandatory reporting, evaluation, and processing of accidents and serious incidents at the aggregate State level.

Certificate holders are required to report certain types of data in accordance with the requirements of the certificate they hold, for example:

- Design and manufacturers (D&M) who hold a design approval must report malfunctions, failures, and defects in accordance with a list of requirements found in 14 CFR part 21.3.[68]
- Organizations with designated authorization (ODA) are required, under 14 CFR part 183, Representatives of the Administrator, to report anything that could be an unsafe condition and non-compliant.[69]
- Operators of any civil aircraft, or any public aircraft not operated by the Armed Forces or an intelligence agency of the U.S., or any foreign aircraft are required to immediately, and by the most expeditious means available, notify the nearest NTSB office of aircraft accidents and incidents in accordance with 49 CFR part 830.[70]
- The drug and alcohol management information system (MIS) contains valuable safety data on drug and alcohol testing reported by all 14 CFR part 121 operators and most other large

[67] This includes the oversight of hazardous materials by ASH.
[68] 14 CFR part 21, Certification Procedures for Products and Parts, Section 21.3, Reporting of Failures, Malfunctions and Defects: http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=2&SID=8181dfd9c231bdcaec4e2bf7bdd66274&ty=HTML&h=L&r=PART&n=14y1.0.1.3.9#14:1.0.1.3.9.1.11.3. Accessed September 17, 2014.
[69] 14 CFR part 183, Representatives of the Administrator, Subpart D, Organization Designation Authorization, Section 183.63, Continuing Requirements: Products, Parts or Appliances: http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=1&SID=8181dfd9c231bdcaec4e2bf7bdd66274&ty=HTML&h=L&r=PART&n=14y3.0.1.5.33#14:3.0.1.5.33.4.3.12. Accessed September 17, 2014.
[70] 49 CFR part 830, Notification and Reporting of Aircraft Accidents or Incidents and Overdue Aircraft, and Preservation of Aircraft Wreckage, Mail, Cargo, and Records, Subpart B - Initial Notification of Aircraft Accidents, Incidents, and Overdue Aircraft: http://www.ecfr.gov/cgi-bin/text-idx?SID=868d4f569d9cba0a8e4cadfed2448bb2&node=49:7.1.4.1.12&rgn=div5. Accessed September 17, 2014.

operators. The system includes information on post-accident, random, and all other types of required tests.

The following are examples of mandatory reporting mechanisms.

Reporting to NTSB

Federal regulations require operators to notify the NTSB immediately of aviation accidents and certain incidents. An accident is defined as 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. An incident is an occurrence other than an accident that affects or could affect the safety of operations.[71]

NTSB maintains a database of accident/incident information, which is publically available on the NTSB website.[72]

Service Difficulty Reporting System (SDRS)

The SDRS is another reporting system in which aircraft owners/operator can report, via a web-based system, maintenance and/or service problems for any aircraft, engine, or component. SDRS is mandatory for commercial operators only. Certificate holders are required to report the occurrence or detection of each failure, malfunction, or defect concerning those listed in 14 CFR part 121 Sec. 121.703.[73]

Voluntary Reporting

Voluntary reporting mechanisms in the U.S. facilitate the collection of safety data that may not be captured by a mandatory incident reporting system. 14 CFR part 193 describes when and how the FAA protects voluntarily reported information from disclosure as provided for in 49 USC 40123, protection of voluntarily submitted information.[74]

Examples of voluntary reporting mechanisms follow.

Flight Operational Quality Assurance (FOQA)

FOQA is a voluntary safety program designed to improve aviation safety through the proactive use of flight recorded data. Operators use the data to identify and correct deficiencies in all areas of flight operations. Properly used, FOQA data can help carriers take action to reduce or eliminate safety risk, as well as minimize deviations from regulations. Through access to de-identified aggregate FOQA data, the FAA can identify and analyze national trends and target resources to reduce operational risk in the NAS, ATC, flight operations, and airport operations.[75]

The development of a FOQA program occurs in stages. During the planning stage, the policy and direction for the FOQA effort are developed and necessary resources are committed to implement the program. The policies, procedures, resources, and operational processes for collecting, managing, and using FOQA data are laid out in the implementation and operations

[71] 49 CFR part 830, Notification and Reporting of Aircraft Accidents or Incidents and Overdue Aircraft and Preservation of Aircraft Wreckage, Mail, Cargo and Records (Section 830.2, Definitions): http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr;sid=bdbd83b90630a32f49bc9b59cc3b8605;rgn=div5;view=text;node=49:7.1.4.1.12;idno=49;cc=ecfr#49:7.1.4.1.12.1.1.2. Accessed September 17, 2014

[72] NTSB Accident Database and Synopses: http://www.ntsb.gov/aviationquery/. Accessed September 17, 2014.

[73] 14 CFR part 121, Section 121.70, Service Difficulty Reports: http://www.ecfr.gov/cgi-bin/text-idx?SID=0583c99bbd978d05cfaecbadb723343d&node=14:3.0.1.1.7.22.3.12&rgn=div8. Accessed September 17, 2014.

[74] 14 CFR part 193, Protection of Voluntarily Submitted Information: http://www.gpo.gov/fdsys/pkg/CFR-2012-title14-vol3/pdf/CFR-2012-title14-vol3-part193.pdf. Accessed September 17, 2014.

[75] FOQA: http://www.faa.gov/about/initiatives/atos/air_carrier/foqa/. Accessed September 17, 2014.

(I&O) plan as the program blueprint, which an air carrier submits to the FAA for approval. Once the FAA approves the FOQA I&O plan, the air carrier implements the program for analyzing, validating, and taking corrective actions based on FOQA data. It is the responsibility of the air carrier to set up procedures for identifying operational deficiencies and taking corrective action.

Aviation Safety Action Program (ASAP)

The purpose of ASAP is to prevent accidents and incidents by encouraging certificate holder employees to voluntarily report safety issues and events. ASAP provides for the education of appropriate parties and the analysis and correction of safety concerns that are identified in the program. ASAPs are intended to create a nonthreatening environment that encourages employees to voluntarily report safety issues even though they may involve violation of 49 USC, Subtitle VII, or violation of 14 CFR. ASAP is based on a safety partnership between the FAA and the certificate holder and may include any third party, such as an employee labor organization. ASAP allows the reporting and collecting of safety information that may not otherwise be obtainable.

Through the analysis of ASAP data, potential precursors to accidents can be identified. The FAA has determined that identifying these precursors is essential to further increasing aviation safety. Under an ASAP, safety issues are resolved through corrective action rather than through punishment or discipline, and it can help to educate appropriate parties in preventing a reoccurrence of the same type of safety event.[76]

Voluntary Safety Reporting Programs (VSRP)

AOV provides guidance for establishing an ASAP for ATO credentialed safety personnel in SOC 07 – 04, *Aviation Safety Action Program (ASAP) For Credentialed ATO Personnel*.[77] The objective of the program is to encourage credentialed personnel to voluntarily report safety information that may be critical to identifying potential precursors to accidents. Under this guidance, safety-related issues are resolved through corrective action rather than through punishment or discipline.

The ATO, in cooperation with its employee labor organizations and AOV, established two voluntary safety reporting programs for controllers and technicians called the Air Traffic Safety Action Program (ATSAP)[78] and the Technical Operations Safety Action Program (T-SAP). The ATO VSRP is modeled after the very successful ASAP program used in the aviation industry. Specifics on the ATO VSRP are contained in JO 7200.20, *Voluntary Safety Reporting Programs*.[79]

ATO employees voluntarily identify and report safety and operational concerns. The collected information is reviewed and analyzed to facilitate early detection and improved awareness of operational deficiencies and adverse trends. The information specified in employee reports is used to identify root causes and determine appropriate remedial actions, which are then monitored for effectiveness. This process promotes collaboration between employee work groups and management for the early identification of hazards and to maintain a proactive approach regarding safety concerns and corrective action recommendations.

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[76] Aviation Safety Action Program (ASAP): https://www.faa.gov/about/initiatives/atos/air_carrier/asap/. Accessed September 17, 2014.
[77] FAA Safety Oversight Circular 07-04, *Aviation Safety Action Program for Credentialed ATO Personnel*: http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aov/policies_forms/media/SOC%2007-04.pdf. Accessed September 17, 2014.
[78] Air Traffic Safety Action Program (ATSAP): https://atsapsafety.com/atsap-home/#. Accessed September 17, 2014.
[79] FAA JO 7200.20, *Voluntary Safety Reporting Programs*: http://www.faa.gov/documentlibrary/media/order/jo7200.20.pdf. Accessed September 17, 2014.

Voluntary Disclosure Reporting Program (VDRP) [80]
The VDRP is intended to improve safety compliance by forgoing a civil penalty when a regulated entity promptly discloses to the FAA an apparent violation and takes prompt action satisfactory to the FAA to correct the violation and preclude its recurrence. The FAA regulates aviation product/service provider performance through setting regulatory standards, issuing guidance, and monitoring compliance through periodic inspections. Regulated entities, which have the ultimate responsibility for compliance, have a superior vantage point for monitoring their own performance. Therefore, voluntary disclosure reporting programs can serve an important role in achieving compliance and improving aviation safety.[81]

FAA Hotline Operations Program
The FAA Hotline Operations Program consolidated two hotline programs—the Administrator's Hotline and the Consumer Hotline. The Administrator's Hotline was established to provide FAA employees with high-level management attention for concerns that were not being resolved by established administrative processes. The Consumer Hotline was established for consumers with questions about FAA services. FAA Order 1070.1. *Hotline Operations Program,* prescribes the operations, responsibilities, and requirements of the Hotline Operations Program.[82]

FAA Safety Hotline
The FAA Safety Hotline provides a single venue for employees and the general public to report concerns involving the FAA. It provides a means for persons with knowledge of unsafe aviation situations, improper recordkeeping, or safety violations to report these without fear of recrimination.[83] Current or former FAA employees may report personnel concerns, inequities, or operational safety ideas that are not being addressed through other agency processes to the FAA Hotline. Individuals may report aviation safety concerns, violations of 14 CFR, concerns involving FAA employees or facilities, maintenance issues, aircraft incidents, and/or aircraft accidents to the FAA Hotline.[84] The FAA Office of Audit and Evaluation collects and forwards all safety-related issues to the appropriate offices.

FAA Safety Recommendation Program
As ASIs, investigators, or any other FAA employee, identify potential safety deficiencies, they are encouraged to submit recommendations to correct those deficiencies as part of the FAA Safety Recommendation program. The AVP Recommendations Branch oversees this program by responding to and coordinating the risk mitigation for approximately 300 safety recommendations received each year.

As a component of the FAA SMS, the FAA Safety Recommendation Program gathers critical insight from the field about safety concerns in all areas of the aviation industry, including international safety recommendations. The program provides a vital method of communication for employees to voice safety concerns and ensure that they will be investigated by the appropriate FAA office.[85]

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[80] VDRP User Guide: https://av-info.faa.gov/vdrp/UserGuide.pdf. Accessed September 17, 2014.
[81] In addition to automated voluntary disclosure reporting programs, there are manually reported voluntary disclosure reporting programs such as those included in the Drug Abatement QMS Procedure (AAM-800-007).
[82] FAA Order 1070.1. *Hotline Operations Program*, published April 17, 2000: http://www.faa.gov/documentLibrary/media/Order/ND/1070.1.pdf. Accessed September 17, 2014.
[83] FAA Hotline Operations Program: http://www.faa.gov/about/office_org/headquarters_offices/aae/programs_services/faa_hotlines/. Accessed September 17, 2014.
[84] Users can fill out a form electronically to report maintenance issues, aircraft incidents, aircraft accidents, or suspected violations of Federal Aviation Regulations at: http://www.faa.gov/contact/safety_hotline/. Accessed September 17, 2014.
[85] AVP-400-001, *FAA Safety Recommendation Program* (internal FAA document; public link not available).

Additional Sources of Data

Additionally, the U.S. established other ways to collect safety information that may not be captured by the mandatory and voluntary reporting mechanisms mentioned above. For example, one way the U.S. collects safety information is through the *Lessons Learned From Transport Airplane Accidents* library, which contains information on most major accidents and their related lessons. The FAA, with support from many other organizations and individuals, plans to continue adding to this material on an annual basis. The objective is to populate the library with many more of the most historically significant, policy shaping accidents, in order to share lessons with others. Although many aviation accidents are extremely tragic events, the lessons learned play an important role in the process to improve aviation safety.[86]

3.2.2 Safety Data Analysis

The U.S. also established procedures to develop and process information from aggregated data sources, which are used within the U.S. safety system to monitor trends in aviation safety and identify any safety issues and address them in the most appropriate ways.

Aviation Safety Information Analysis and Sharing (ASIAS)

The ASIAS program is a collaborative effort among industry and the U.S. government to allow unique capabilities in the collection and analysis of aviation safety data.[87] It is a national resource for use in discovering common, systemic safety problems that span multiple mandatory and voluntary data sources from airlines, fleets, and regions of the national air transportation system. This wide range of data is collected from sources such as internal FAA datasets, airline proprietary safety data, publicly available data, and manufacturer data. The data is fused in order to identify safety trends in the NAS. ASIAS now includes 47 airlines, including nine General Aviation (GA) corporate members representing 96 percent of all commercial air carrier operations.

Created in 2007, ASIAS is a key enabler of performing safety management and is integrated into the process for the Commercial Aviation Safety Team (CAST), a world-renowned, voluntary, risk mitigation program. In 2008, CAST reported an 83 percent reduction in the fatal accident rate with the implementation of critical safety enhancements, some of which were derived from forward-looking data analysis in ASIAS. CAST is described further in Sections 3.2.3, *Aviation Safety Information Exchange* and 4.2, *External Training, Communication, and Dissemination of Safety Information*.

Safety insights derived from ASIAS are communicated to other aviation safety programs within the FAA, such as, the General Aviation Joint Steering Community (GAJSC), the FAA Office of NextGen, and FAA safety assurance activities.

ASIAS enables users to perform integrated queries across multiple dynamic databases of safety data, search an extensive warehouse of stored data, and display pertinent elements in multiple formats for efficient trend analysis. The FAA expanded its ASIAS capabilities to aggregate and integrate safety information from across the aviation industry. By developing new analytical methodologies and leveraging state-of-the-art information technology (IT), the FAA and its industry stakeholders are able to monitor the effectiveness of implemented safety enhancements, establish baselines and trending capability using safety metrics, and identify emerging risks from safety data from multiple databases.

[86] Lessons Learned From Transport Airplane Accidents library: http://lessonslearned.faa.gov/. Accessed September 17, 2014.
[87] ASIAS: http://www.asias.aero/overview.html. Accessed September 17, 2014.

ASIAS is also accessing reports from ATSAP, a program that provides air traffic controllers with a way to report potential safety hazards. Other ATO employees will be added to the program in the future. Additionally ASIAS uses FOQA data, representing over 40 percent of all commercial operations, and ASAP reports from 44 U.S. air carriers, representing 96 percent of all commercial operations. Data available in ASIAS includes 50,000 ATSAP reports, 8.1 million FOQA reports, and 110,000 ASAP reports.

Aviation Safety Reporting System (ASRS)

The ASRS is an important facet of the continuing effort by government, industry, and individuals to maintain and improve aviation safety. ASRS collects voluntarily submitted aviation safety incident/situation reports from pilots, controllers, and others.[88] It acts on the information these reports contain and identifies system deficiencies, and issues, alerting messages to persons in a position to correct them. The ASRS educates through its newsletter *CALLBACK*, its journal *ASRS Directline,* and through its research studies. Its database is a public repository which serves the needs of the FAA, NASA, and other organizations worldwide that are engaged in research and the promotion of safe flight.

ASRS collects, analyzes, and responds to voluntarily submitted aviation safety incident reports in order to lessen the likelihood of aviation accidents. ASRS data are used to:

- Identify deficiencies and discrepancies in the NAS so that these can be remedied by appropriate authorities;
- Support policy formulation and planning for, and improvements to, the NAS; and
- Strengthen the foundation of aviation human factors safety research. This is particularly important since it is generally conceded that over 66 percent of all aviation accidents and incidents have their roots in human performance errors.

NTSB Accident Data Management System

The NTSB maintains the Aviation Accident Database, which contains the probable cause and other data describing:

a) All civil aviation accidents occurring in the U.S. and its territories;
b) Government public use accidents occurring under certain conditions;
c) Accidents occurring in foreign states involving civil aircraft of U.S. registry or a U.S.-based operator; and
d) Some non-accident events (aviation incidents) that could affect the safety of U.S. aircraft operations (event occurrences).

Data entered into the database come directly from the investigation records of the NTSB and from foreign investigation authorities when the NTSB serves as an accredited representative to an investigation. Board investigators enter accident/incident data using a web-based data entry system.

Established in 1962, the database has undergone several major revisions to incorporate new technologies and data collection standards. The most recent update occurred in December 2013, when the data entry system was updated to include new data sources and investigation management tools. The current version of the database incorporates ICAO Accident/Incident Data Reporting (ADREP), CAST/ICAO Common Taxonomies, the International Register of Civil Aircraft, automated official weather, and airport data sources. Data are regularly converted to the European Coordination Centre for Accident and Incident Reporting Systems (ECCAIRS) data format for sharing with international authorities. Approximately 2,000 new accident and

[88] ASRS website: http://asrs.arc.nasa.gov/. Accessed September 17, 2014.

incident records are added to the database each year. The Board publishes annual statistical summaries of the data, for both commercial and GA, and makes these summaries available via the Internet and other sources. The NTSB provides public access to all of its accident and incident records on the agency's website, where an online search tool is provided.[89]

Safety Performance and Analytical System (SPAS)

SPAS is a web-based application inspectors can use to evaluate current decision support tools designed primarily to assist FAA inspectors and supervisors with surveillance planning, safety assessments, certification, and investigation activities. Using SPAS, inspectors can:

- Identify certificate holders and specific areas that may present a greater risk, thus warranting further surveillance or other action;
- Analyze safety-critical performance measures and profiles;
- Plan surveillance and establish/update surveillance work programs based on analysis; and
- Use SPAS data for planning an ATOS Comprehensive Assessment Plan (CAP), as applicable.[90]

3.2.3 Aviation Safety Information Exchange

The U.S. shares safety information with its service providers and other States, as appropriate. Some of the many examples of U.S. aviation safety information exchange mechanisms are described below.

Global Safety Information Exchange (GSIE)

The U.S. promotes information exchange with other States through its participation in the GSIE. GSIE is a collaboration effort launched by ICAO in September 2010 to confidentially share information about aviation safety incidents, enabling ICAO to identify trends that may lead to safety improvements through risk reduction. The International Air Transport Association (IATA), ICAO, the U.S. DOT, and the European Commission (EC), the executive body of the European Union (EU), signed a MOU to create the framework and path forward to launch the GSIE.

Aviation Safety InfoShare

InfoShare is a semi−annual event that allows airlines and others to share safety findings and potential issues in an open environment. The group identifies safety issues and concerns for further action and shares best practices in analysis and mitigation.

Commercial Aviation Safety Team (CAST)

Founded in 1998, CAST developed an integrated, data driven strategy to reduce the commercial aviation fatality risk in the U.S. and to promote new government and industry safety initiatives throughout the world. The nation's impressive safety record is due in part to the aviation industry and government voluntarily investing in the right safety enhancements to reduce the fatality risk in commercial air travel in the U.S. The work of CAST, along with new aircraft, regulations, and other activities, reduced the fatality risk for commercial aviation in the U.S. by 83 percent from 1998 to 2008.

Since the creation of ASIAS in 2007, CAST integrated ASIAS capabilities into its own safety enhancement processes. The group is moving beyond the "historic" approach of examining past accident data to a more proactive approach that focuses on detecting risk, using incident data,

[89] The NTSB website provides access to several items related to the data the NTSB maintains: http://www.ntsb.gov/data/index.html. Accessed September 17, 2014.

[90] FAA Order 8900.1 CHG 227, Volume 1 – General Inspector Guidance and Information, Chapter 1 – Handbook Organization, Use, and Revision, Section 4 - FAA Computer Databases: http://fsims.faa.gov/wdocs/8900.1/V01%20General/Chapter%2001/01_001_004.htm. Accessed September 17, 2014.

and implementing mitigation strategies before accidents or serious incidents occur. The goal over the next decade is to transition to prognostic safety analysis. CAST aims to reduce the U.S. commercial fatality risk by 50 percent from 2010 to 2025.

Government CAST Members include the European Aviation Safety Agency (EASA), FAA, NASA, Transport Canada Civil Aviation (TCCA), and U.S. DoD. Employee Group CAST Members include Air Line Pilots Association (ALPA), Allied Pilots Association (APA), and National Air Traffic Controllers Association (NATCA). Industry CAST Members include Aerospace Industries Association (AIA), Airbus, Airports Council International (ACI), Airlines for America (A4A), The Boeing Company, Flight Safety Foundation, General Electric (representing all engine manufacturers), National Air Carrier Association (NACA), and Regional Airline Association (RAA). Various government agencies and industry organizations also attend CAST as observers.[91]

Safety Management International Collaboration Group (SM ICG)

The SM ICG was founded by the FAA, EASA, and TCCA and is a joint cooperation between many regulatory authorities for the purpose of promoting a common understanding of safety management principles and requirements and facilitating their implementation across the international aviation community. The current core membership of the SM ICG includes the Aviation Safety and Security Agency (AESA) of Spain, the National Civil Aviation Agency (ANAC) of Brazil, the Civil Aviation Authority of the Netherlands (CAA NL), the Civil Aviation Authority of New Zealand (CAA NZ), the Civil Aviation Safety Authority (CASA) of Australia, the Direction Générale de l'Aviation Civile (DGAC) in France, the EASA, the Federal Office of Civil Aviation (FOCA) of Switzerland, Japan Civil Aviation Bureau (JCAB), the U.S. FAA, TCCA, and the Civil Aviation Authority of United Kingdom (UK CAA). ICAO participates as an observer.

Members of the SM ICG:

- Collaborate on common SSP/SMS topics of interest;
- Share lessons learned;
- Encourage the progression of a harmonized SMS;
- Share products with the aviation community; and
- Collaborate with international organizations such as ICAO and civil aviation authorities that have implemented or are implementing SSP/SMS.

Cooperative Development of Operational Safety and Continued Airworthiness Programs (COSCAPS)

The U.S. participates in COSCAPS, such as with EASA, which promotes the highest common standards of safety and environmental protection in civil aviation in Europe and worldwide.

Information Sharing with ICAO

The U.S. established procedures and mechanisms for sharing accident and incident information with ICAO. For example, the U.S. participates in the ADREP system, which is operated and maintained by ICAO. The ADREP system receives, stores, and provides States with occurrence data that will assist them in validating safety. In this context, the term ‘occurrence’ includes both accidents and incidents. The system was established in 1976 but has evolved to meet changes in IT and the aviation industry. The version currently in use is ADREP 2000.[92]

[91] CAST Fact Sheet, FAA Web site: http://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=15214. Accessed September 17, 2014.
[92] ICAO ADREP SKYbrary page: http://www.skybrary.aero/index.php/ICAO_ADREP. Accessed September 17, 2014.

In addition to ADREP reporting, the U.S. also shares its International Aviation Safety Assessments (IASA) summary information with ICAO. The FAA established the IASA program through public policy in August of 1992. The FAA foreign assessment program focuses on a State's ability, not the individual air carrier, to adhere to international SARPs for aircraft operations and maintenance established by ICAO.

In mid-1991, the FAA began to formulate a program to address concerns about proper licensing and safety oversight in other States. This program included visits to twelve countries with airlines seeking authority to operate to and from the U.S. After a trial period, the findings convinced the FAA of the need to formally establish the IASA Program. Notice of the new policy was published in the *Federal Register*, Vol. 57, No. 164, August 24, 1992. The purpose of IASA is to ensure that all foreign air carriers that operate to or from the U.S. are properly licensed and have safety oversight provided by a competent Civil Aviation Authority (CAA) in accordance with ICAO standards.[93]

3.2.4 Aviation Safety Performance

The U.S. strives to provide the safest, most efficient aerospace system in the world. To achieve that mission, the U.S. is building on safety management principles to proactively address emerging safety risk by using consistent, data-informed approaches to make smarter, system-level, risk-based decisions.

The U.S. traditionally measures the safety of its system by monitoring safety performance measures such as those listed in the *FAA Fiscal Year (FY) 2013 Performance and Accountability Report*:[94] In FY 2013, the FAA met five of six safety goals, including the domestic commercial aviation fatal accident safety goal. Current performance targets include:

- Reduce the commercial air carrier fatalities per 100 million persons on board by 24 percent over a 9-year period (2010-2018). No more than 6.2 in 2018.
- Reduce the GA fatal accident rate to no more than 1 fatal accident per 100,000 flight hours by 2018.
- Maintain the rate of serious runway incursions at or below 20 per 1000 events.
- Reduce risk in flight by limiting the rate of the most serious losses of standard separation to 20 or fewer for every thousand (.02) losses of standard separation within the NAS.
- Implement 40 percent of mitigating strategies for the top 5 airport risk areas.
- Ensure no cyber security event significantly degrades or disables a mission-critical FAA system.
- No fatalities, serious injuries, or significant property damage to the uninvolved public during licensed or permitted space launch and reentry activities.

In 2012, the FAA started an agency-wide Metrics Harmonization effort. The agency was faced with an increasing number of metrics being used or reported by various organizations, use of various data sources for the same calculation, use of multiple names for the same metric definition, and use of multiple definitions under the same metric name. The Metrics Harmonization effort is addressing terminology, methodology, and stewardship across the FAA LOBs for all metrics. Its purpose is to bring order, consistency, and accuracy to metric reporting. The FAA Harmonized Operational Metrics website presents the agency's harmonized operational metrics.

[93] International Aviation Safety Assessments: http://www.faa.gov/about/initiatives/iasa/. Accessed September 17, 2014.
[94] *FAA Fiscal Year 2013 Performance and Accountability Report,* page 44: http://www.faa.gov/about/plans_reports/media/2013_FAA_PAR.pdf. Accessed September 17, 2014.

The metrics displayed show how the FAA is performing in the areas of Environment, Safety, Efficiency, Capacity, and Cost Effectiveness.[95]

Risk-Based Decision Making Initiative

Because commercial aviation accidents are becoming rare occurrences, the FAA needs to identify and mitigate precursors to accidents (i.e., safety risk) to manage and improve aviation safety. The FAA has built the foundation to address these challenges by incorporating safety management principles into operational processes to enable better informed decisions from a safety perspective. The FAA Administrator's Risk-Based Decision Making Initiative flows from the safety management principles, builds on existing processes, and directly addresses the challenges faced by the FAA. It will increase safety and efficiency by taking advantage of the growing availability of safety data and the development of powerful analytical capabilities to systematically integrate the management of safety risk into decision making.

In the face of growing complexity throughout the industry, the Risk-Based Decision Making Initiative aims to make the safest and most efficient aerospace system in the world even safer and more efficient. Through increased sharing of safety data among FAA organizations, industry, and international peers, a broader spectrum of data will become available. By analyzing that data to identify hazards and predict their associated safety risk, the FAA will be in a position to address that risk. The FAA will coordinate and share the resulting information with decision makers, allowing the people who are in the best position to manage the safety risk to do so in order to make the U.S. aviation system even safer. By acting in an integrated manner with industry and global partners to transform its safety system, the FAA will be able to identify hazards and mitigate their associated risk before they become accidents.

In addition to the performance measures mentioned above, the FAA is developing the following metrics to track and measure safety risk:

Outcome measures

- Decreased safety risk *(measure to be developed)*
- Decreased commercial fatality rate
- Prioritized resources based on safety risk

Process measures

- Number of cross-organizational decisions made using safety data
- Number of FAA organizations with safety data-informed decision processes

The U.S. regularly monitors its safety indicators to assure that corrective or follow-up actions are taken for any undesirable trends, alert level breaches, or non achievement of improvement targets.

FAA SMS Committee and Safety Performance Management

The U.S. recognizes the importance of improving safety performance management capabilities. As a member of the SM ICG, the FAA contributed to the development of *A Systems Approach to Measuring Safety Performance – The Regulator Perspective.*[96] Building on that effort, the FAA established working groups under the FAA SMS Committee to further develop the safety measurement framework and how it will be applied by the FAA. The groups have two primary functions: to develop a Significant Safety Issue (SSI) identification process, which uses

[95] FAA Harmonized Operational Metrics: http://www.faa.gov/about/plans_reports/operational_metrics/. Accessed September 17, 2014.

[96] SM ICG product *A Systems Approach to Measuring Safety Performance – The Regulator Perspective,* published January 27, 2014: http://www.skybrary.aero/bookshelf/books/2620.pdf. Accessed September 17, 2014.

previously analyzed data; and to implement a process for safety performance management in AVS, which will be leveraged at the agency level.

First, the FAA will develop and implement processes to identify and mitigate the safety risk of cross-organizational issues that are found to exist as a result of incidents in the system. This activity will ensure that decision makers have the information necessary to consider the safety impact of their decisions in a more consistent and overt fashion and with an integrated view. This means SSIs will be identified, safety risk will be analyzed and assessed using SRM, and criteria for the elevation of decisions to treat the risk will be applied. The resultant information will feed corporate-level decision-making processes in the FAA.

Second, the FAA will establish a safety performance management process to develop an aggregate view of safety in the components of the aerospace system for which the FAA has oversight responsibility. AVS will have the primary responsibility for aggregation of safety performance measures and developing the system-view. The safety performance management process will be applicable to any organization that directly influences (or regulates) industry behaviors to manage risk. Throughout the development, processes for measuring and monitoring safety performance at the system level and within the domains of AVS Services/Offices will be prototyped and tested. Ultimately, the processes developed will be refined and adapted for use agency wide.

3.3 Safety Data Driven Targeting of Oversight on Areas of Greater Concern or Need

The U.S. developed risk-based oversight systems for various sectors of the industry to prioritize inspections, audits, and surveys toward those areas of greater safety concern or need, as identified by the analysis of data on hazards, their consequences in operations, and the assessed safety risk. Examples of processes and data sources used for prioritization include the following.

3.3.1 Air Transportation Oversight System (ATOS)

ATOS was established to oversee 14 CFR part 121 operators. ATOS implements FAA policy by providing safety controls (i.e., regulations and their application) of business organizations and individuals that fall under FAA regulations. Three major functions further define the oversight system—design assessment, performance assessment, and risk management. Design assessment is the ATOS function that ensures an air carrier's operating systems comply with regulations and safety standards. Performance assessments confirm that an air carrier's operating systems produce intended results, including mitigation or control of hazards and associated risk. The risk management process deals with hazards and associated risk and is used to manage FAA resources according to risk-based priorities.[97]

3.3.2 System Approach for Safety Oversight (SASO)

The System Approach for Safety Oversight (SASO) program is designed to improve, standardize, and automate the FAA's safety oversight and inspection policies and processes in accordance with ICAO SMS principles. SASO implements new AFS business processes, automation tools, and associated policy designed to assist the ASI work force and others in performing their oversight mission and function more effectively. This will be accomplished by

[97] ATOS page on FAA website: http://www.faa.gov/about/initiatives/atos/. Accessed September 17, 2014

designing and developing oversight tools and associated policies that implement the ICAO SMS components:

- Safety Policy
- Safety Assurance
- Safety Risk Management
- Safety Promotion

The initial product of the SASO program is the AFS Safety Assurance System (SAS), an automated, risk-based, decision support tool. SAS provides a comprehensive, standardized methodology for the safety oversight of aviation certificate holders and will improve the FAA's ability to identify and address hazards and safety risks before they result in degraded safety performance.

SASO implementation Phase 2a is focused on the development and implementation of the web-based SAS for Title 14, Code of Federal Regulations Part 121 (Air Carriers), Part 135 (Commuter and On-Demand Operations) and Part 145 (Repair Stations). SASO implementation Phase 2b, currently in the planning stage, will expand the SAS for all remaining applicable Title 14 CFR Parts; reengineer and consolidate AFS oversight business processes and systems in accordance with the FAA Enterprise Architecture; and implement processes and tools supporting the three remaining SMS components (Safety Policy, Safety Risk Management, and Safety Promotion).

3.3.3 Monitor Safety/Analyze Data (MSAD)

AIR uses the MSAD process and IT tool to analyze event-based safety data, identify the appropriate response to significant events in support of COS, and detect trends that could lead to future events. The MSAD process helps AIR identify safety issues in in-service aircraft fleets and identify corrective actions to mitigate safety risk across the fleet. The process uses product-defined hazard criteria to pinpoint potential hazards from pools of safety data. With MSAD, AIR can better identify emerging safety trends through dependent variable analysis. In addition, MSAD establishes a causal analysis approach to identify the underlying contributing factors of significant events, such as process breakdowns, which are then communicated to the appropriate AVS oversight business process owner.[98]

3.3.4 Risk Based Resource Targeting (RBRT)

The RBRT process and IT tool assess risk and identify risk management options in order to establish work priorities and allocate resources. It is a sub-process used in other AIR business processes such as type and production certification, certificate management, and designee management. This process establishes risk thresholds that provide a consistent approach for AIR involvement and prioritization decisions, thereby allowing AIR to manage resources with a consistent understanding of the risk based on real-time data. RBRT provides a means to identify what activities warrant the assignment of FAA resources and allows risk-based business and safety decision making.

3.3.5 Aerospace Medicine Safety Information System

The Aerospace Medicine Safety Information System (AMSIS) will provide an aerospace medical information network that integrates critical medical information from geographically distributed locations nationally and internationally. AMSIS will provide the design for and development of

[98] FAA Order 8010.107A, *Monitor Safety/Analyze Data,* published October 1, 2012: https://www.iaff.org/hs/LODD_Manual/Resources/FAA%20Aircraft%20Accident%20and%20Incident%20Notification,%20Investigation,%20and%20Reporting.pdf. Accessed September 17, 2014.

new information systems architecture; design, procure, and deploy next generation information systems. The program objectives include providing tools necessary for AAM to analyze information to make risk-based policy decisions through an automated method of collecting, reviewing, and analyzing medical information for airmen and air traffic control specialists (ATCS).

This system will ensure timely and comprehensive access to data, thereby improving timeliness and accuracy while eliminating paper-based correspondence. It will also enable collaboration within the aviation community, both domestic and international, as well as among personnel, designees, and applicants. Data will be secured and remain easily accessible, while facilitating management and workforce decision making, thereby providing the basis for a proactive safety approach with improved productivity.

3.3.6 NTSB Most Wanted List

The NTSB Most Wanted List[99] represents the Board's advocacy priorities for transportation improvements. It is designed to increase awareness of, and support for, the most critical changes needed to reduce transportation accidents and save lives.

[99] NTSB Most Wanted List: http://www.ntsb.gov/safety/mwl.html. Accessed September 30, 2014.

4 State Safety Promotion

An effective safety promotion program is essential to support the core operational objectives of the U.S. SSP. As part of their missions and responsibilities, both the FAA and the NTSB provide various types of safety-related training and actively communicate safety information to their employees to support the development of a culture that fosters an effective and efficient SSP. In addition, they provide education and communicate safety relevant information to support a positive safety culture among aviation service providers.

4.1 Internal Training, Communication, and Dissemination of Safety Information

The FAA and NTSB currently provide various types of safety-related training to their employees and actively communicate safety information to their workforce. Further enhancements will be made as a result of SSP development.

4.1.1 FAA Competencies and Training

The FAA sets, oversees, and enforces safety standards for any person or organization that operates in the U.S. aerospace system, including airmen, airlines, manufacturers, repair stations, mechanics, and air traffic controllers. Completing this mission requires a dedicated workforce of safety critical and operational support professionals located in offices around the country and abroad. The FAA established competencies and training to ensure technical employees, such as inspectors, engineers, pilots, physicians, nurses, and accident investigators, have the necessary technical and analytical skills to meet its safety mission.

FAA Competencies

The FAA adopted an agency-wide hiring practice of conducting a thorough job analysis on all of its positions to ensure that an accurate and timely assessment of the duties to be performed and competencies required are identified prior to recruiting and filling positions. It uses a recruitment and hiring system called the Automated Vacancy Information Access Tool for On-Line Referral (AVIATOR) to facilitate the overall application and selection process for positions. In 2013, the AVIATOR system was integrated into the Office of Personnel Management's automated hiring system, USAJOBS. The agency also uses FAA Managerial and Employee Leadership Competency Profiles to correlate and define interpersonal and business competencies, which are part of the knowledge, skills, and abilities (KSAs) when creating vacancy announcements. In FY 2013, vacancy announcements included competencies that supported safety management as well as interpersonal and business requirements. With SSP implementation in mind, FAA LOBs developed safety management-related competencies to ensure that personnel requirements are aligned with the safety management principles and FAA employees have the requisite skills and knowledge to perform effectively in the U.S. SSP.

FAA Training

The FAA Academy provides technical and managerial training and development for both its workforce and the aviation community.[100] Since courses have different admissions criteria, prospective participants are admitted on a course-by-course basis. Many courses are available to other government agencies, industry, and international civil aviation authorities. The FAA Academy received accreditation from the North Central Association (NCA) of Colleges and

[100] More information on FAA Academy courses: https://www.academy.jccbi.gov/catalog/. Accessed September 17, 2014.

Schools on March 19, 1991. Each year since, the Academy has been found to meet or exceed NCA's rigorous accreditation standards. The Academy has the honor of being the first federal non-military training organization accredited by NCA.

The FAA curriculum includes initial, recurrent, and specialty courses. Employees complete initial technical courses and additional training needs are identified during annual calls for training requirements, which are role-based and competency focused. Supervisors work with employees to determine what kind of training is needed. They also evaluate the skill sets represented in their offices to determine if additional skills are needed. Inspectors, designee advisors, and flight test pilots receive initial and recurrent training tailored to their particular job responsibilities.

Specific to SSP and SMS, FAA organizations have identified their own training needs. For instance, AVS developed an *AVSSMS Training Plan* that outlines an effective safety management training development and delivery strategy within AVS. The plan will be carried out to meet organizational needs and provide AVS employees the knowledge and skills necessary to succeed as the organization continues to apply safety management principles to safety oversight.

A few safety management related courses available to FAA employees include:

- FAA Safety Risk Management (SRM) Overview (FAA27000023)
- Safety Management System (SMS) Basics for AVS (FAA27000020)
- Fundamentals of Risk Analysis (FAA27200019)
- Apollo Root Cause Analysis (FAA22000001)
- Measuring Organizational Performance (FAA01254)
- Safety Assurance System (SAS) Overview for Managers Workshop (FAA21000070)
- Overview of Air Transportation Oversight System (ATOS) and System Safety Oversight (FAA27100001)
- Safety Management System (SMS) Theory and Application (FAA15249001)
- Planning, Conducting, and Reporting Evaluations Course (FAA60000013)
- Safety Management System (SMS) Overview for FAA Airports (ARP) (FAA06000005)
- Safety Risk Management (SRM) Practitioner Course (FAA06000006)

In addition, the FAA ATO developed considerable SMS training for its employees, including material on the conduct of SRM, panel facilitation, SRM document writing, leadership roles in SMS, and lessons learned. While designed for a service provider, the coursework has proven to be beneficial to other FAA employees, including those with oversight responsibilities.

4.1.2 NTSB Competencies and Training

The NTSB promotes transportation safety by:

- Maintaining its congressionally mandated independence and objectivity;
- Conducting objective, precise accident investigations and safety studies;
- Performing fair and objective airman and mariner certification appeals; and
- Advocating and promoting NTSB safety recommendations.

Completing this mission requires a dedicated quality workforce, whose competencies keep pace with the increasingly complex technologies of the U.S. transportation systems. The NTSB established competencies and training to ensure its investigators—in the occupations of Accident Investigation, Air Safety Investigation, Aerospace Engineer, Psychologist (Human

Performance), Scientist (Chemist, Metallurgist, Meteorologist), and Transportation Specialist—are equipped to meet its safety mission.[101]

NTSB Competencies

In 2008, the NTSB also began work on defining investigative competencies for the key occupations identified in the Strategic Human Capital Plan in order to identify gaps. Information from government-wide competency studies, human resources (HR) records such as position descriptions, and training center core competencies helped define a draft competency model that was revised and completed through focus group meetings with investigators and supervisors. The competency model covers both general and technical competencies needed by accident investigators.

A self-assessment of the competency proficiency levels of the investigator workforce (the "supply") was conducted using an online tool in May 2010. During the same timeframe, each technical office completed an online competency needs assessment (the "demand"). Analysis of the results provided a means to identify gaps in workforce competencies that NTSB will address through application of a variety of human capital tools. The summarized results of the competency assessment project were shared with senior leaders, with managers and supervisors in the technical offices, and with the investigator workforce. The results will be used in establishing training and development plans for the workforce. In addition, the information is used by managers and supervisors to budget for training and development and to plan for their future hiring priorities.

NTSB Training

The NTSB Training Center provides training for NTSB investigators and others from the transportation community to improve their practice of accident investigation techniques. The curriculum promotes independent, objective, and technically advanced accident investigations that will enhance the safety of all modes of transportation. The mission of the NTSB Training Center is to promote safe transport by:

- Ensuring and improving the quality of accident investigation through critical thought, instruction, and research;
- Communicating lessons learned, fostering the exchange of new ideas and new experience, and advocating operational excellence;
- Providing a modern platform for accident reconstruction and evaluation; and
- Utilizing its high-quality training resources to facilitate family assistance and first responder programs, sister agency instruction, and other compatible federal activity.

A few aviation safety related courses available at the NTSB Training Center[102] include:

- Seminar on Lessons Learned from Experimental Amateur-Built Aircraft Accidents
- Aircraft Accident Investigation (AS101)
- Rotorcraft Accident Investigation (AS102)
- Aircraft Accident Investigation for Aviation Professionals (AS 301)
- Survival Factors in Aviation Accidents (AS302)
- Investigating Human Fatigue Factors (IM303)
- Managing Communications During an Aircraft Accident or Incident (PA302)

[101] *National Transportation Safety Board Strategic Human Capital Plan FY 2011 - 2016*, published September 30, 2011: https://www.ntsb.gov/doclib/agency_reports/SHCP_2011_2016.pdf. Accessed September 17, 2014.
[102] NTSB Training Center 2013 Course Schedule: http://www.ntsb.gov/trainingcenter/CourseInfo/sched_courses_2013.html. Accessed September 17, 2014.

4.1.3 Communication of Safety Information

A successful SSP hinges on effective communication strategies and plans that facilitate a common understanding of the future vision of safety management across State agencies; promote commitment; motivate people to become actively engaged; and share lessons learned.

FAA Communication

The FAA communicates with employees in a variety of ways, including, but not limited to: training, events/conferences, workshops, broadcast email messages, articles on the employee website and the public website, social media, organizational newsletters, and printed FAA publications.

FAA organizations have communicated the vision for SSP and the application of safety management principles in its orders, process guidance, implementation plans, communication strategy documents, and training plans. A few examples of publicly available documents are:

- FAA Order 8000.369A, *Safety Management System*
- FAA Order 8040.4A, *Safety Risk Management Policy*
- FAA Order 5200.11, *FAA Airports (ARP) Safety Management System*
- FAA Order VS 8000.367A, *Aviation Safety (AVS) Safety Management System Requirements*
- FAA Order 1070.1, *Hotline Operations Program*
- FAA Safety Hotline

Another element of a successful SSP is the role of leadership. FAA leaders take an active role in communicating with and engaging employees by:

- Using Town Hall meetings to update employees on current activities and accomplishments;
- Conducting Site Visits to offices throughout the country;
- Encouraging participation in the U.S. DOT IdeaHub, a department-wide online collaborative tool used to create ideas and help shape solutions for improving FAA's workplace;
- Promoting the All Points Safety campaign, a multimedia communications effort intended to increase awareness of and participation in the FAA's proactive safety management;
- Launching the Partnership for Safety to help proactively identify and mitigate operational safety problems by establishing Local Safety Councils and encouraging frontline employees to participate in safety culture improvement; and
- Holding various meetings and conferences to provide managers and other employees the resources and skills needed to better support day-to-day operations.

NTSB Communication

The NTSB has communicated its vision for the application of safety management principles on its website.[103]

Useful management practices critical to a successful SSP include seeking and monitoring employee attitudes, encouraging two-way communication between employees and management, and incorporating employee feedback into new policies and procedures. This type of communication and collaboration across offices at all levels can improve an organization's ability to carry out its mission by providing opportunities to share best practices and helping to ensure that any needed input is provided in a timely manner. To this end, NTSB senior managers hold periodic meetings with staff, conducting outreach to regional offices, and surveying staff about the effectiveness of communication techniques. In addition, the NTSB administered internal communication surveys from 2009 through 2011, which provided

[103] NTSB Most Wanted, 2011-2012: http://www.ntsb.gov/safety/mwl-3.html. Accessed September 17, 2014.

information that helped identify continuing barriers to employee and management communication. In 2012, the NTSB developed an action plan in this area that included detailed activities, target dates, and regular status reports. Furthermore, the NTSB continues to monitor employees' views about employee and management communication to address any issues.

4.2 External Training, Communication, and Dissemination of Safety Information

The U.S. provides education and promotes awareness of safety risk and two-way communication of safety-relevant information to support, among service providers, the development of an organizational culture that fosters effective and efficient safety management principles. The U.S. makes safety training available to the industry and communicates safety information through various methods and media including: State and industry conferences/seminars; Congressional briefings and factsheets; presentations, workshops and panel discussions; video messages; SMS content on the public FAA website; FAA social media; print materials (posters, flyers, brochures); and FAA publications for external audiences. Section 3.2.3, *Aviation Safety Information Exchange*, describes safety information sharing between the U.S. government, industry, and other States; and this section elaborates on that communication.

4.2.1 Service Provider Information Exchange

Access to Safety Information

As discussed previously, the U.S. provides effective open access to all regulatory information and FAA orders. Additionally, the U.S. provides safety information to service providers by way of dissemination of notices, such as:

- Information for Operators (InFO)
- Safety Alert for Operators (SAFO)
- Notice to Airmen (NOTAM)
- General Notice (GENOT)
- Temporary Flight Restrictions (TFR)

As discussed earlier, the NTSB maintains a public database of accident investigations and safety recommendations.

Government/Industry Collaboration

The U.S. also has numerous government/industry collaboration efforts aimed at exchanging safety information with service providers. Efforts are targeted to the needs of sectors or regions. For example, the FAA and GA leaders convene annually for a GA Safety Summit aimed at improving GA safety, one of the FAA's top priorities.[104] Another example is the Medallion Foundation, formed from an infamous legacy of too many aircraft accidents and fatalities in Alaska, the Medallion Foundation was established by the Alaska Air Carriers Association in 2001 to improve pilot safety awareness and reduce air carrier insurance rates.[105]

Other examples of Government/Industry collaboration include the following.

[104] General Aviation Safety Summit Press Release, January 27, 2014: http://www.faa.gov/news/press_releases/news_story.cfm?newsId=15634. Accessed September 17, 2014.
[105] Medallion Foundation website: http://medallionfoundation.org/. Accessed September 17, 2014.

Commercial Aviation Safety Team (CAST)
CAST is a group of key aviation stakeholders from government, industry, and labor organizations that collaborates to develop a voluntary, prioritized safety agenda. Together with its international partners, CAST aims to lead the worldwide aviation community to the highest levels of global commercial aviation safety. CAST follows a mature continuous improvement framework built on the proactive identification of current and future risks, developing mitigations as needed, and monitoring the effectiveness of implemented actions. More information on the history and membership of CAST can be found in Section 3.2.3, *Aviation Safety Information Exchange*.[106]

SMS Focus Group (SMSFG)
The SMSFG is a Voluntary Implementation Users Group that provides a two-way communication mechanism between the SMS Program Office and participants in voluntary implementation. It also provides a forum for knowledge sharing among participants. SMSFG Meetings are conducted semi-annually, and offer a forum for Pilot Project Participants to share best practices and lessons learned with each other and the FAA SMS Program Office.

Flight Standards SMS Newsletter
FAA AFS publishes a monthly SMS newsletter aimed at keeping AFS employees and industry informed on current SMS news and activities. The latest editions can be found on the FAA AFS website.[107]

4.2.2 International Information Exchange

The FAA provides leadership and support to a number of international bodies with the aim of improving aviation safety and ensuring the global harmonization of safety management. Each year, the FAA provides technical assistance and training to regulators and air navigation service providers in more than 100 countries, continually seeking to expand the agency's network of collaborative partners. These international efforts include the following.

<u>International Groups, Programs, and Events</u>

CAST/ICAO Common Taxonomy Team (CICTT)
International safety data sharing initiatives, such as the CICTT, contribute to the FAA's air traffic safety improvement objectives. The CICTT includes experts from a variety of backgrounds, all tasked with developing common taxonomies and definitions for aviation accident and incident reporting systems. The result will be a standardized industry language that will improve the quality of information and communication and greatly enhance the aviation community's capacity to focus on common safety issues. In FY 2012, the FAA led the ATC portion of CICTT efforts that resulted in a mapping taxonomy that relates the EUROCONTROL Risk Analysis Tool/FAA Risk Analysis Process (RAP) Tool classification system to that of ATSAP. This represents the first step toward a harmonized international taxonomy.[108]

International Visitors Program (IVP)
Each year, approximately 4,000 aviation professionals participate in the IVP. Whether touring headquarters or other FAA facilities throughout the U.S., the focus of the IVP is on advancing

[106] Additional information regarding CAST can be found on the FAA website: http://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=15214. Accessed September 17, 2014.
[107] Flight Standards SMS Newsletter can be found on the AFS website: http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs900/sms/. Accessed September 17, 2014.
[108] CAST/ICAO Common Taxonomy Team: http://www.intlaviationstandards.org/. Accessed September 17, 2014.

international cooperation in the research, development, and acquisition of aviation systems and technologies that enhance aviation safety. Through the program, the FAA is able to build and foster stronger relationships with civil aviation counterparts and provide foreign visitors with the opportunity to improve their knowledge of FAA programs and technologies.[109]

NextGen International Outreach

As part of its responsibility for International Leadership, the FAA Office of International Affairs is promoting NextGen internationally. NextGen is a comprehensive upgrade of the NAS that will fundamentally change the way air traffic is managed. FAA Senior Representatives around the world and at FAA Headquarters work with international partners to help other States understand FAA NextGen programs, plans, and activities for moving from a ground-based system of air traffic control to a satellite-based system of air traffic management. This includes looking at the impact of these systems domestically and internationally in an effort to harmonize global interoperability and standards as the FAA implements NextGen.[110]

ICAO and Global Initiatives Staff

The ICAO and Global Initiatives Staff is based at FAA headquarters in Washington, DC and is responsible for:

- Leading the development of international policies and procedures that provide information and direction to international stakeholders both inside and outside the FAA;
- Managing the agency's activities with ICAO;
- Managing the IVP;
- Providing executive secretariat services for IGIA;
- Leading FAA strategic and business planning activities for the office and developing FAA international priorities;
- Managing agency efforts to secure funding for international aviation projects from U.S. government and international donor organizations; and
- Serving as the Secretariat for the Agency's Crisis Response Working Group (CRWG) on issues related to international aviation including the coordination of the FAA's position with other U.S. government agencies.

International Aviation Safety Assessment (IASA)

The FAA established the IASA program through public policy in August of 1992. The FAA's foreign assessment program focuses on a State's ability, not the individual air carrier, to adhere to international SARPs for aircraft operations and maintenance established by the United Nation's technical agency for aviation, ICAO. The purpose of IASA is to ensure that all foreign air carriers that operate to or from the U.S. are properly licensed and have safety oversight provided by a competent CAA in accordance with ICAO standards.

The FAA is working to determine that each country meets its obligations under ICAO and provides proper oversight to each air carrier operating into the U.S. The continued application of this program will result in a lower number of safety-related problems—including accidents and incidents—and an improved level of safety to the flying public.[111]

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[109] FAA International Visitors Program: https://www.faa.gov/about/office_org/headquarters_offices/apl/international_affairs/visitors/. Accessed September 17, 2014.
[110] NextGen International Outreach: http://www.faa.gov/about/office_org/headquarters_offices/apl/international_affairs/international_nextgen/ Accessed September 17, 2014.
[111] IASA page on FAA website: http://www.faa.gov/about/initiatives/iasa/. Accessed September 17, 2014.

Safety Management International Collaboration Group (SM ICG)
The U.S. belongs to the SM ICG, a group of 12 aviation regulatory bodies, which has produced several products to promote a common understanding of SMS and SSP principles and requirements. SM ICG products are published on SKYbrary.[112] In addition, the group began holding Industry Day events, which represent a rare opportunity for aviation service providers to hear directly from authorities that are working together on safety management.

Global Safety Information Exchange (GSIE)
The U.S. participates in the GSIE. IATA, ICAO, the U.S. DOT, and the EC signed an MOU to create the framework and path forward to launch the GSIE.

EASA/FAA International Aviation Safety Conference
The EASA/FAA International Aviation Safety Conference has a long standing tradition—it has been organized and co-chaired by the two main technical aviation safety authorities of Europe and the U.S. for the last three decades. Since 1983, the conference has been hosted in annually rotating order by the FAA and the Joint Aviation Authorities (JAA), taken over on the European side by the EASA in 2005.

ICAO Panels
The U.S. actively participates in regional aviation safety information groups such as the Annex 19 panel.

International Training
The FAA's contribution to the growth of leadership skills in foreign aviation professionals is an integral component of developing civil aviation organizations worldwide. The FAA is committed to investing in people who will drive aviation safety and efficiency improvement within their aviation authorities. The FAA promotes developmental opportunities for current and potential foreign leaders to mentor and influence aviation leaders and enhance foreign aviation expertise. The FAA is continually looking for new opportunities to develop programs that teach junior level aviation professionals best practices in strategic planning, program management, regulatory practices, and organizational development.

By FY 2013, the FAA planned to work with at least 18 countries or regional organizations to develop aviation leaders to strengthen the global aviation infrastructure. The FAA has been successful in the development and recommendation of aviation-focused programs such as the Department of State International Visitor Leadership Program (IVLP) process, Executive Management Development Training, and management courses at the FAA Academy.

The FAA Academy is committed to improving worldwide aviation safety by providing quality training and related service to the international community. The Academy offers a wide range of training including Technical Operations, Airworthiness, Avionics, Aircraft Certification, Airports, Air Traffic Control, Flight Inspection, Aviation English and Management. Most of the FAA training courses are offered to international participants. The International Training Program (ITP) is responsible for enrolling international participants and can provide additional information on training courses available at the FAA Academy.

[112] SM ICG main page: http://www.skybrary.aero/index.php/Safety_Management_International_Collaboration_Group_(SM_ICG). Accessed September 17, 2014.

Appendix A: ICAO SSP Framework

This appendix contains the ICAO SSP Framework as documented in ICAO Annex 19, Safety Management, Attachment A, *Framework for a State Safety Programme*.

ATTACHMENT A. FRAMEWORK FOR A STATE SAFETY PROGRAMME (SSP)

This attachment introduces a framework for the implementation and maintenance of an SSP by a State. An SSP is a management system for the management of safety by the State. The framework includes the four components as established in Chapter 3, 3.1.1 in this Annex and its related eleven elements as outlined hereunder. The implementation of an SSP is commensurate with the size and complexity of the State's aviation system and necessitates coordination among the authorities responsible for individual elements of civil aviation functions in the State. The SSP framework introduced in this attachment, and the SMS framework specified in Appendix 2, must be viewed as complementary, yet distinct, frameworks. This attachment also includes a brief description of each element of the framework.

Note.— Within the context of this attachment the term "service provider" refers to those organizations listed in Chapter 3, 3.1.3.

1. State safety policy and objectives

    1.1 State safety legislative framework
    1.2 State safety responsibilities and accountabilities
    1.3 Accident and incident investigation
    1.4 Enforcement policy

2. State safety risk management

    2.1 Safety requirements for the service provider's SMS
    2.2 Agreement on the service provider's safety performance

3. State safety assurance

    3.1 Safety oversight
    3.2 Safety data collection, analysis and exchange
    3.3 Safety-data-driven targeting of oversight of areas of greater concern or need

4. State safety promotion

    4.1 Internal training, communication and dissemination of safety information
    4.2 External training, communication and dissemination of safety information

1. State safety policy and objectives

1.1 State safety legislative framework

The State has promulgated a national safety legislative framework and specific regulations, in compliance with international and national standards, that define how the State will conduct the

management of safety in the State. This includes the participation of State aviation organizations in specific activities related to the management of safety in the State, and the establishment of the roles, responsibilities and relationships of such organizations. The safety legislative framework and specific regulations are periodically reviewed to ensure they remain relevant and appropriate to the State.

1.2 State safety responsibilities and accountabilities

The State has identified, defined and documented the requirements, responsibilities and accountabilities regarding the establishment and maintenance of the SSP. This includes the directives to plan, organize, develop, maintain, control and continuously improve the SSP in a manner that meets the State's safety objectives. It also includes a clear statement about the provision of the necessary resources for the implementation of the SSP.

1.3 Accident and incident investigation

The State has established an independent accident and incident investigation process, the sole objective of which is the prevention of accidents and incidents, and not the apportioning of blame or liability. Such investigations are in support of the management of safety in the State. In the operation of the SSP, the State maintains the independence of the accident and incident investigation organization from other State aviation organizations.

1.4 Enforcement policy

The State has promulgated an enforcement policy that establishes the conditions and circumstances under which service providers are allowed to deal with, and resolve, events involving certain safety deviations, internally, within the context of the service provider's SMS, and to the satisfaction of the appropriate State authority. The enforcement policy also establishes the conditions and circumstances under which to deal with safety deviations through established enforcement procedures.

2. State safety risk management

2.1 Safety requirements for the service provider's SMS

The State has established the controls which govern how service providers will identify hazards and manage safety risks. These include the requirements, specific operating regulations and implementation policies for the service provider's SMS. The requirements, specific operating regulations and implementation policies are periodically reviewed to ensure they remain relevant and appropriate to the service providers.

2.2 Agreement on the service provider's safety performance

The State has agreed with individual service providers on the safety performance of their SMS. The agreed safety performance of an individual service provider's SMS is periodically reviewed to ensure it remains relevant and appropriate to the service providers.

3. State safety assurance

3.1 Safety oversight

The State has established mechanisms to ensure effective monitoring of the eight critical elements of the safety oversight function. The State has also established mechanisms to ensure that the identification of hazards and the management of safety risks by service providers follow established regulatory controls (requirements, specific operating regulations and implementation policies). These mechanisms include inspections, audits and surveys to ensure that regulatory safety risk controls are appropriately integrated into the service provider's SMS, that they are being practised as designed, and that the regulatory controls have the intended effect on safety risks.

Note.— Guidance on the implementation of this element is contained in the Safety Management Manual (SMM) *(Doc 9859).*

3.2 Safety data collection, analysis and exchange

The State has established mechanisms to ensure the capture and storage of data on hazards and safety risks at both an individual and aggregate State level. The State has also established mechanisms to develop information from the stored data, and to actively exchange safety information with service providers and/or other States as appropriate.

3.3 Safety-data-driven targeting of oversight of areas of greater concern or need

The State has established procedures to prioritize inspections, audits and surveys towards those areas of greater safety concern or need, as identified by the analysis of data on hazards, their consequences in operations, and the assessed safety risks.

4. State safety promotion

4.1 Internal training, communication and dissemination of safety information

The State provides training and fosters awareness and two-way communication of safety-relevant information to support, within the State aviation organizations, the development of an organizational culture that fosters an effective and efficient SSP.

4.2 External training, communication and dissemination of safety information

The State provides education and promotes awareness of safety risks and two-way communication of safety-relevant information to support, among service providers, the development of an organizational culture that fosters an effective and efficient SMS.

Appendix B: Acronyms/Abbreviations

A4A - Airlines for America

AAM - Office of Aerospace Medicine

AC - Advisory Circular

ACI - Airports Council International

AD - Airworthiness Directive

ADG - Office of Hazardous Materials Safety

ADI - Action Determination and Implementation

ADREP - Accident/Incident Data Reporting

AESA - Aviation Safety and Security Agency of Spain

AFN - Office of Finance and Management

AFS - Flight Standards Service

AIA - Aerospace Industries Association

AIP - Airport Improvement Program

AIR - Aircraft Certification Service

ALPA - Air Line Pilots Association

AME - Aviation Medical Examiner

AMSIS - Aerospace Medicine Safety Information System

ANAC - National Civil Aviation Agency of Brazil

ANG - Next Generation Air Transportation System (NextGen) Organization

ANSP - Air Navigation Service Provider

AOV - Air Traffic Safety Oversight Service

APA - Administrative Procedure Act

APA - Allied Pilots Association

API - Office of International Affairs

ARC - Aviation Rulemaking Committee

ARP - Office of Airports

ASAP - Aviation Safety Action Program

ASH - Office of Security & Hazardous Materials Safety

ASI - Aviation Safety Inspector

ASIAS - Aviation Safety Information Analysis and Sharing

ASRS - Aviation Safety Reporting System

AST - Office of Commercial Space Transportation

ATC - Air Traffic Control

ATC - Amended Type Certification

ATCS - Air Traffic Control Specialists

ATO - Air Traffic Organization

ATOS - Air Transportation Oversight System

ATSAP - Air Traffic Safety Action Program

AVIATOR - Automated Vacancy Information Access Tool for On-Line Referral

AVP - Accident Investigation and Prevention

AVS - Aviation Safety Organization

AVSSMS - Aviation Safety Safety Management System

CAA - Civil Aviation Authority

CAA NL - Civil Aviation Authority of the Netherlands

CAA NZ - Civil Aviation Authority of New Zealand

CAMI - Civil Aerospace Medical Institute

CAP - Comprehensive Assessment Plan

CAP - Corrective Action Plan

CASA - Civil Aviation Safety Authority of Australia

CAST - Commercial Aviation Safety Team

CFR - Code of Federal Regulations

CICTT - CAST/ICAO Common Taxonomy Team

CMA - Continuous Monitoring Approach

COS - Continued Operational Safety

COSCAPS - Cooperative Development of Operational Safety and Continued Airworthiness Programs

CRWG - Crisis Response Working Group

D&M - Design and Manufacturing

DG - Dangerous Goods

DGAC - Direction Générale de l'Aviation Civile (CAA in France)

DHS - Department of Homeland Security

DoD - Department of Defense

DOT - Department of Transportation

EASA - European Aviation Safety Agency

EC - European Commission

ECCAIRS - European Coordination Centre for Accident and Incident Reporting Systems

EIS - Enforcement Information System

EO - Executive Order

EU - European Union

FAA - Federal Aviation Administration

FOCA - Federal Office of Civil Aviation of Switzerland

FOIA - Freedom of Information Act

FOQA - Flight Operational Quality Assurance

FSIMS - Flight Standards Information Management System

FY - Fiscal Year

GA - General Aviation

GAJSC - General Aviation Joint Steering Community

GAO - Government Accountability Office

GENOT - General Notice

GSA - General Services Administration

GSIE - Global Safety Information Exchange

HMSP - Hazardous Materials Safety Program

HR - Human Resources

I&O - Implementation and Operations

IASA - International Aviation Safety Assessments

IATA - International Air Transport Association

ICAO - International Civil Aviation Organization

ICAP - Interagency Committee for Aviation Policy

IGIA - Interagency Group on International Aviation

InFO - Information for Operators

IT - Information Technology

ITP - International Training Program

IVLP - International Visitor Leadership Program

IVP - International Visitors Program

JAA - Joint Aviation Authorities

JCAB - Japan Civil Aviation Bureau

JPDO - Joint Planning and Development Office

KSA - Knowledge, Skills, and Abilities

LOB - Line of Business

LOSA - Line Operational Safety Audits

MIS - Management Information System

MOU - Memorandum of Understanding

MSAD - Monitor Safety/Analyze Data

MSMS - Manufacturers Safety Management System

NACA - National Air Carrier Association

NAS - National Airspace System

NASA - National Aeronautics and Space Administration

NATCA - National Air Traffic Controllers Association

NCA - North Central Association

NextGen - Next Generation Air Transportation System

NOTAM - Notice to Airmen

NPRM - Notice of Proposed Rulemaking

NTSB - National Transportation Safety Board

ODA - Organizations with Designated Authorization

OIG - Office of Inspector General

OMB - Office of Management and Budget

OST - Office of the Secretary of Transportation

PC - Production Certificate

PHMSA - Pipeline and Hazardous Materials Safety Administration

PL - Public Law

PMA - Parts Manufacturer Approval

PTRS - Program Tracking and Reporting Subsystem

QMS - Quality Management System

RAA - Regional Airline Association

RAP - Risk Analysis Process

RBRT - Risk Based Resource Targeting

RSAT - Repair Station Assessment Tool

RWI - Rulemaking Work Instructions

SAFO - Safety Alert for Operators

SAIB - Special Airworthiness Information Bulletin

SARPs - Standards and Recommended Practices

SAS - Safety Assurance System

SASO - System Approach for Safety Oversight

SCMP - Strategic Compliance Monitoring Plan

SD - Safety Directive

SDRS - Service Difficulty Report System

SEP - Surveillance Enhancement Program

SM ICG - Safety Management International Collaboration Group

SMS - Safety Management System

SMSFG - Safety Management System Focus Group

SNPRM - Supplemental Notice of Proposed Rulemaking

SOC - Safety Oversight Circular

SOP - Standard Operating Procedure

SPAS - Safety Performance Analysis System

SRM - Safety Risk Management

SSI - Significant Safety Issue

SSP - State Safety Program

STC - Supplemental Type Certificate

TC - Type Certificate

TCCA - Transport Canada Civil Aviation

TFR - Temporary Flight Restriction

TI - Technical Instructions

TSA - Transportation Security Administration

T-SAP - Technical Operations Safety Action Program

TSOA - Technical Standard Order Authorization

UK CAA - Civil Aviation Authority of United Kingdom

U.S. - United States

USC - United States Code

USCA - United States Code Annotated

USOAP - Universal Safety Oversight Audit Program

VDRP - Voluntary Disclosure Reporting Program

Appendix C: Related Documents

ICAO Documents

- ICAO Safety Management Manual
- International Civil Aviation Organization (ICAO) Standards and Recommended Practices (SARPs):
    - Annex 1: Personnel Licensing
    - Annex 2: Rules of the Air
    - Annex 6: International Commercial Air Transport – Aeroplanes; International General Aviation – Aeroplanes; and International Operations – Helicopters
    - Annex 7: Aircraft Nationality and Registration Marks
    - Annex 8: Airworthiness of Aircraft
    - Annex 10: Radio Navigation Aids; Communications Procedures; Communications Systems; Surveillance Radar and Collision Avoidance Systems; and Aeronautical Radio Frequency Spectrum Utilization
    - Annex 11: Air Traffic Services
    - Annex 13: Aircraft Accident and Incident Investigation
    - Annex 14: Aerodrome Design and Construction, and Heliports
    - Annex 18: Safe Transport of Dangerous Goods by Air
    - Annex 19: Safety Management, including State Safety Program Framework Attachment
- ICAO Document: Doc 9284, AN/905, *Technical Instructions for the Safe Transport of Dangerous Goods by Air*

U.S. Legislation

- Title 49 of the United States Code (USC) —Transportation
- 49 USC Subtitle I — Department of Transportation¸ Section 106
- 49 USC Subtitle II — Other Government Agencies, Chapter 11
- 49 USC Chapter 11 Section 1131, General Authority
- 49 USC Chapter 11 Section 1132, Civil Aircraft Accident Investigations
- The Federal Aviation Act of 1958
- The Airport and Airway Development Act of 1970
- Independent Safety Board Act of 1974 (49 USCA app. § 1901 [1982])
- The Wendell H. Ford Aviation Investment and Reform Act for the 21st Century
- The Aviation and Transportation Security Act of 2001
- The Homeland Security Act of 2002
- The Vision 100 — Century of Aviation Reauthorization Act of 2003
- The Airline Safety and FAA Extension Act,
- The FAA Modernization and Reform Act of 2012
- The Administrative Procedure Act (APA), enacted June 11, 1946
- Regulatory Flexibility Act
- Paperwork Reduction Act
- Hazardous Materials Transportation Act
- *Federal Register*, The Daily Journal of the United States Government
- Freedom of Information Act (FOIA)
- Privacy Act

U.S. Presidential Executive Orders

- EO 12866, Regulatory Planning and Review

- EO 11382, Establishment of the Department of Transportation

U.S. Regulations

- Title 14 of the Code of Federal Regulations (14 CFR), Aeronautics and Space
    - 14 CFR part 5, Safety Management Systems
    - 14 CFR part 21, Certification Procedures for Products and Parts
    - 14 CFR part 119, Certification: Air Carriers and Commercial Operators
    - 14 CFR part 120, Drug and Alcohol Testing Program
    - 14 CFR part 121, Operating Requirements: Domestic, Flag, and Supplemental Operations
    - 14 CFR part 129, Operations: Foreign Air Carriers and Foreign Operators of U.S.-Registered Aircraft Engaged in Common Carriage
    - 14 CFR part 135, Operating Requirements: Commuter and On Demand Operations and Rules Governing Persons on Board Such Aircraft
    - 14 CFR part 139, Certification of Airports
    - 14 CFR part 145, Repair Stations
    - 14 CFR part 183, Representatives of the Administrator
    - 14 CFR part 193, Protection of Voluntarily Submitted Information
- Title 49 of the CFR, Transportation
    - 49 CFR part 172, Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements. and Security Plan
    - 49 CFR part 173,Shippers General Requirements For Shipments and Packagings
    - 49 CFR part 175, Carriage By Aircraft CFR part 139, Certification of Airports

U.S. Multi-Agency Aviation Safety Documents

- *Integrated Plan for the Next Generation Air Transportation System*, published December 2004
- *Department of Transportation Review Plan*
- *The JPDO Safety Management System Standard*, 2008
- *A Systems Approach to Measuring Safety Performance – The Regulator Perspective*

U.S. Aviation Safety Plans and Reports

- *FAA Strategic Initiatives Summary*, 2014
- *FAA FY 2013 Performance and Accountability Report*
- *FAA SMS Implementation Plan*
- *FAA AVSSMS Implementation Plan*
- *ATOS Comprehensive Assessment Plan (CAP)*
- *NTSB Strategic Human Capital Plan FY 2011 - 2016*, published September 30, 2011

FAA Orders

- FAA Order 8000.369A, *Safety Management System*
- FAA Order 1220.2G, *FAA Procedures for Handling National Transportation Safety Board Recommendations*
- FAA Order 2150.3B, *FAA Compliance and Enforcement Program*
- FAA Order 8000.81, *Designation of Flight Operational Quality Assurance (FOQA) Information as Protected from Public Disclosure under 14 CFR part 193*
- FAA Order 8000.82, *Designation of Aviation Safety Action Program (ASAP) Information as Protected from Public Disclosure Under 14 CFR part 193*
- FAA Order 8000.89, *Designation of Voluntary Disclosure Reporting Program (VDRP) Information as Protected from Public Disclosure under 14 CFR part 193*

- FAA Order 1100.161, *Air Traffic Safety Oversight*
- FAA Order 8000.86, *Air Traffic Oversight Compliance Process*
- FAA JO 1000.37, *Air Traffic Organization Safety Management System*
- FAA Order VS 8000.367A, *Aviation Safety (AVS) Safety Management System Requirements*
- FAA Order 1800.56N, *National Flight Standards Work Program Guidelines*
- FAA Order 8900.1, *Flight Standards Information Management Systems (FSIMS)*
- Strategic Compliance Monitoring Plan (SCMP)
- FAA Order 9120.1B, *Drug and Alcohol Compliance and Enforcement Inspector Handbook*
- *Antidrug and Alcohol Misuse Prevention Program Operations Specifications* (A449)
- FAA Order 8020.11C, *Aircraft Accident and Incident Notification, Investigation, and Reporting*
- FAA Order 1220.2G, *FAA Procedures for Handling National Transportation Safety Board (NTSB) Recommendations*
- FAA Order 5280.5C, *Airport Certification Program Handbook*
- FAA Order 5200.11*, FAA Airports Safety Management System* in August 2010
- FAA Order JO 7210.632, *Air Traffic Organization Occurrence Reporting*
- FAA Order 1070.1. *Hotline Operations Program*
- FAA Order 8040.4A, *Safety Risk Management Policy*
- FAA Order 8010.107A, *Monitor Safety/Analyze Data*
- FAA Order 1650.9A, *Transportation of Hazardous Materials*
- FAA Order JO 7200.20, *Voluntary Safety Reporting Programs*

FAA Processes and Guidance

- FAA's *Rulemaking Work Instructions (RWI)*
- *ATO Safety Management System Manual*
- Advisory Circular (AC) 120-92A, *Safety Management Systems for Aviation Service Providers*
- *Safety Management System (SMS) Assurance Guide*
- *Safety Management System (SMS) Implementation Guide*
- *FAA AFS SMS Guidebook*
- *The D&M SMS Pilot Project Guide*
- AC 150/5200-37, *Introduction to Safety Management Systems (SMS) for Airport Operators*
- Letter of Authorization (A049) - Notice 8900.18 - Recording Operations Specifications for Part 145 Repair Stations
- AOV Surveillance Process document, AOV 002-001
- AVP-100-001, *Aircraft Accident and Incident Notification, Investigation and Reporting*
- AVP-200-001, *Aviation Safety Information Analysis and Sharing (ASIAS) Study Process*
- *Office of Airports SMS Desk Reference*
- VDRP User Guide
- AVP-400-001, *FAA Safety Recommendation Program*

FAA Safety Management Training Courses

- FAA Safety Risk Management (SRM) Overview (FAA27000023)
- Safety Management System (SMS) Basics for AVS (FAA27000020)
- Fundamentals of Risk Analysis (FAA27200019)
- Apollo Root Cause Analysis (FAA22000001)
- Measuring Organizational Performance (FAA01254)
- Safety Assurance System (SAS) Overview for Managers Workshop (FAA21000070)
- Overview of Air Transportation Oversight System (ATOS) and System Safety Oversight (FAA27100001)

- Safety Management System (SMS) Theory and Application (FAA15249001)
- Planning, Conducting, and Reporting Evaluations Course (FAA60000013)
- Safety Management System (SMS) Overview for FAA Airports (ARP) (FAA06000005)
- Safety Risk Management (SRM) Practitioner Course (FAA06000006)

NTSB Accident Investigation Training Courses

- NTSB Training Center 2013 Course Schedule
- Seminar on Lessons Learned from Experimental Amateur-Built Aircraft Accidents
- Aircraft Accident Investigation (AS101)
- Rotorcraft Accident Investigation (AS102)
- Aircraft Accident Investigation for Aviation Professionals (AS 301)
- Survival Factors in Aviation Accidents (AS302)
- Investigating Human Fatigue Factors (IM303)
- Managing Communications During an Aircraft Accident or Incident (PA302)

International Documents

- Safety Management International Collaboration Group (SM ICG) product, *A Systems Approach to Measuring Safety Performance – The Regulator Perspective*
- *Technical Instructions for the Safe Transport of Dangerous Goods By Air*

Relevant Websites

- 14 CFR on the U.S. Government Printing Office website: http://www.gpo.gov/fdsys/pkg/CFR-2004-title14-vol1/content-detail.html
- ADREP site: http://legacy.icao.int/fsix/adrep/index.html
- Airport Improvement Program (AIP): http://www.faa.gov/airports/aip/
- Air Traffic Safety Action Program (ATSAP): https://atsapsafety.com/atsap-home/#
- ASIAS: http://www.asias.aero/overview.html
- ASRS website: http://asrs.arc.nasa.gov/
- ATOS: http://www.faa.gov/about/initiatives/atos/
- Aviation Safety Action Program (ASAP): https://www.faa.gov/about/initiatives/atos/air_carrier/asap/
- CAST Fact Sheet: http://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=15214
- CAST/ICAO Common Taxonomy Team (CICTT): http://www.intlaviationstandards.org/
- DOT OIG: https://www.oig.dot.gov/
- DOT Review Plan: http://www.dot.gov/regulations/dots-review-plan
- FAA Academy courses: https://www.academy.jccbi.gov/catalog/
- FAA Harmonized Operational Metrics: http://www.faa.gov/about/plans_reports/operational_metrics/
- FAA International Visitors Program: https://www.faa.gov/about/office_org/headquarters_offices/apl/international_affairs/visitors/
- FAA Regulations and Guidance: http://www.faa.gov/regulations_policies/
- FAA Safety Hotline: http://www.faa.gov/contact/safety_hotline/
- Flight Operational Quality Assurance (FOQA): http://www.faa.gov/about/initiatives/atos/air_carrier/foqa/
- FOIA: http://www.foia.gov/about.html
- GAO: http://www.gao.gov/
- Global Issues and Presidential Initiatives: http://www.faa.gov/about/office_org/headquarters_offices/apl/international_affairs/global_issues_president_init/
- IASA: http://www.faa.gov/about/initiatives/iasa/
- ICAP: http://www.gsa.gov/portal/category/21234

- International Aviation Safety Assessments: http://www.faa.gov/about/initiatives/iasa/
- Lessons Learned From Transport Airplane Accidents library: http://lessonslearned.faa.gov/
- Medallion Foundation: http://medallionfoundation.org/.
- NextGen International Outreach: http://www.faa.gov/about/office_org/headquarters_offices/apl/international_affairs/international_nextgen/
- NTSB Accident Reports: http://www.ntsb.gov/aviationquery/
- NTSB Most Wanted http://www.ntsb.gov/safety/mwl-3.html
- NTSB Office of Aviation website: https://www.ntsb.gov/about/office_as.html
- NTSB website: http://www.ntsb.gov
- SASO: http://www.faa.gov/about/initiatives/saso/
- SM ICG SKYbrary site: http://www.skybrary.aero/index.php/Safety_Management_International_Collaboration_Group_(SM_ICG)
- Title 49 USC: http://www.gpo.gov/fdsys/pkg/USCODE-2011-title49/html/USCODE-2011-title49.htm