



governmentattic.org

"Rummaging in the government's attic"

Description of document: Federal Aviation Administration (FAA) Unmanned Aircraft Systems Integration Research Management Plan, 2017

Requested date: 19-July-2017

Released date: 10-August-2017

Posted date: 23-April-2018

Source of document: National Freedom of Information Act Office, AFN-140
Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591
Fax: (202) 267-6514
[FAA Headquarters Online FOIA Request portal](#)

The governmentattic.org web site ("the site") is noncommercial and free to the public. The site and materials made available on the site, such as this file, are for reference only. The governmentattic.org web site and its principals have made every effort to make this information as complete and as accurate as possible, however, there may be mistakes and omissions, both typographical and in content. The governmentattic.org web site and its principals shall have neither liability nor responsibility to any person or entity with respect to any loss or damage caused, or alleged to have been caused, directly or indirectly, by the information provided on the governmentattic.org web site or in this file. The public records published on the site were obtained from government agencies using proper legal channels. Each document is identified as to the source. Any concerns about the contents of the site should be directed to the agency originating the document in question. GovernmentAttic.org is not responsible for the contents of documents published on the website.



U.S. Department
of Transportation
**Federal Aviation
Administration**

Unmanned Aircraft Systems
Integration Office
490 L'Enfant Plaza
Washington, DC 20024

AUG 10 2017

FEDERAL EXPRESS

Re: Freedom of Information Act (FOIA) request 2017-008572

This letter responds to your July 19, 2017 Freedom of Information Act (FOIA) request for a copy of the Federal Aviation Administration's (FAA) Unmanned Aircraft Systems (UAS) Research Management Plan.

A records search was conducted in the FAA UAS Integration Office. Enclosed is a copy of the UAS Research Management Plan.

Portions of information, contained on pages 8 and 9 of the plan, are being withheld under Exemption 5 of the FOIA. Exemption 5 allows agencies to withhold recommendations, opinions, and analysis under the deliberative process privilege. To allow release of these records would discourage the open and frank discussions between agency employees that are helpful in development and implementation of the plan and also create confusion in those cases where recommendations and opinions are not adopted. Exemption 5 may be used to protect deliberative, pre-decisional materials, such as advice, opinions, and recommendations rendered by agency staff in the course of reaching a final determination or position on any particular matter under agency consideration.

The undersigned is responsible for this partial denial. You may request reconsideration of this determination by writing the Assistant Administrator for Finance and Management (AFN-140), Federal Aviation Administration, 800 Independence Avenue, SW, Washington DC, 20591 or through electronic mail at: FOIA-Appeals@faa.gov. Your request for reconsideration must be made in writing within 90 days from the date of this letter and must include all information and arguments relied upon. Your letter must state that it is an appeal from the above-described denial of a request made under the FOIA. The envelope containing the appeal should be marked "FOIA Appeal."

You also have the right to seek dispute resolution services from the FAA FOIA Public Liaison via phone (202-267-7799) or email (7-AWA-ARC-FOIA@faa.gov) noting FOIA Public Liaison in the Subject or the Office of Government Information Services (<https://ogis.archives.gov>) via phone (202-741-5770 / toll-free--1-877-684-6448; fax--202-741-5769); or email (ogis@nara.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "William E. Crozier", with a horizontal line extending to the right.

William E. Crozier
Deputy Executive Director

FAA
Unmanned Aircraft Systems
Integration
Research Management Plan

Version 1.1

March 2, 2017

AUS-300

Contents

Executive Summary	4
Introduction.....	5
AUS-300: Structure and Functions	5
UAS R&D Drivers, Influences, & Governance	8
FAA Strategic Plan for Integration of UAS into the NAS.....	8
Implementation Plan for Integration of UAS into the NAS	8
Congressional Mandates	9
AVS R&D Process	9
AVS R&D Strategic Guidance	12
AFN Determination of RED Funds	12
Service Level Agreement (SLA)	12
National Aviation Research Plan	13
Budget Narratives.....	14
Research, Engineering, and Development Advisory Committee	14
NAS Enterprise Architecture (EA) and NAS Segment Implementation Plan (NSIP).....	15
UAS R&D Roadmap.....	15
The Scope of AUS-300	15
UAS Research Internal to the FAA	15
RED Funding.....	18
F&E Funding.....	19
AIP.....	19
UAS Research with External Partners.....	20
National Aeronautics and Space Administration.....	20
UAS Center of Excellence	21
UAS Test Sites	22
Pathfinder Research	22
Executive Committee SAA Science and Research Panel (SARP).....	22
RTCA Special Committee 228 (SC-228).....	22
International.....	23
Moving Forward	23
Appendices	25
Appendix A: 1100 Order Announcing Establishment of Unmanned Aircraft Systems Integration Office (AUS)	25

Appendix B: AVS Research and Development Strategic Guidance for FY2019	36
Appendix C: Acronyms.....	51

Executive Summary

The Federal Aviation Administration (FAA) recently established the Unmanned Aircraft Systems (UAS) Integration Office as an office reporting directly to the Associate Administrator for Aviation Safety (AVS). The UAS Integration Office (AUS) is responsible for supporting the development and implementation of regulations, policies, procedures, guidance, and standards that govern UAS operations, and the safe integration of UAS into the National Airspace System (NAS). AUS has a research and development (R&D) division, AUS-300, which is responsible for the strategic planning and direct support of continued UAS R&D.

AUS-300 works with AVS Services and Offices (S/Os) and across FAA Lines of Business (LOBs) to identify, plan, execute, and manage UAS research that supports safe UAS integration in the NAS. The division also collaborates across governmental agencies, with industry, academia, and international groups.

Section 2211 of The FAA Extension, Safety, and Security Act of 2016 directs the FAA to “work with NASA and stakeholders in industry and academia to develop a research and development roadmap, with the estimates, schedules, and benchmarks for integrating UAS into the NAS.” As a starting point, AUS-300 is developing this FAA Unmanned Aircraft Systems Integration Research Management Plan to describe the approach for FAA-wide planning and coordination of UAS integration research.

This Research Management Plan documents the functions of AUS-300 and describes how this division supports the FAA UAS integration mission through the coordination of UAS research efforts. This Plan also describes the scope of UAS integration research, including influencing factors and constraints, as well as key collaborative partnerships, both internal and external to the FAA.

Introduction

The Federal Aviation Administration (FAA) recently established the Unmanned Aircraft Systems (UAS) Integration Office (AUS), which is responsible for supporting the development and implementation of regulations, policies, procedures, guidance, and standards that govern UAS operations and that are needed for the safe integration of UAS in the National Airspace System (NAS)¹. AUS reports directly to the Associate Administrator for Aviation Safety (AVS) and coordinates with all AVS Services and Offices (S/Os) and all FAA Lines of Business (LOBs), ensuring harmonization of all UAS integration efforts within the FAA.

The mission of AUS is to facilitate the safe, efficient, and timely integration of UAS in the NAS. Among its responsibilities, AUS:

- Determines UAS research needs, and proposes UAS research requirements.
- Assists in establishing the Agency's UAS research priorities.
- Provides guidance to UAS research and development (R&D) programs for AVS.
- Supports similar functions for FAA and government UAS research partners in collaboration with AVS.

To carry out these research responsibilities, AUS has an R&D division, AUS-300, charged with the strategic planning and direct support of continued UAS R&D.

Section 2211 of The FAA Extension, Safety, and Security Act of 2016² directs the FAA to “work with NASA and stakeholders in industry and academia to develop a research and development roadmap, with the estimates, schedules, and benchmarks for integrating UAS into the NAS.” As a starting point, AUS-300 is developing this FAA Unmanned Aircraft Systems Integration Research Management Plan describing the approach for FAA-wide planning and coordination of UAS integration research.

This Research Management Plan describes how AUS-300 works with research partners across FAA LOBs, government agencies, industry, academia, and international groups to accomplish FAA UAS integration research activities and to advocate research priorities to all UAS stakeholders. This Plan also describes the scope of the AUS-300 domain, including the factors which influence, drive, and bound UAS research.

AUS-300: Structure and Functions

The AUS-300 division is responsible for strategic planning and direct support of continued UAS R&D. The division also provides input on requests for research required for advanced mitigation. This division performs the following functions:

¹ U.S. Department of Transportation Federal Aviation Administration Order N1100.XXX. Aviation Safety Organizational Change. October 27, 2016.

² <https://www.congress.gov/114/bills/hr636/BILLS-114hr636enr.pdf>

- Identifies R&D needs for the safe integration of UAS into the NAS; coordinates with all appropriate LOBs and S/Os within the Agency to ensure needed UAS research activities are accomplished; and identifies areas of research within the UAS community where research opportunities may be leveraged.
- Serves as the AVS focal point for development of Agency R&D programs related to UAS operations.
- Participates in the AVS Research, Engineering, and Development (RED) Group representing AUS-1 in the execution of the AVS R&D process and the execution of AVS R&D program activities.
- Organizes and leads the Technical Community Representative Group (TCRG) for UAS activities.
- Oversees the execution of UAS research in the AVS R&D portfolio in conjunction with research execution organizations.
- Coordinates research with key government and industry partners to support FAA strategic initiatives.
- Participates in national and international working groups as needed to understand research and development needs to progress key policy and technical needs for UAS integration.
- Identifies knowledge gaps, proposes research, and sponsors approved research covering all aspects of UAS integration.

To effectively perform these functions, AUS-300 has adopted an organizational structure comprised of distinct roles as follows:

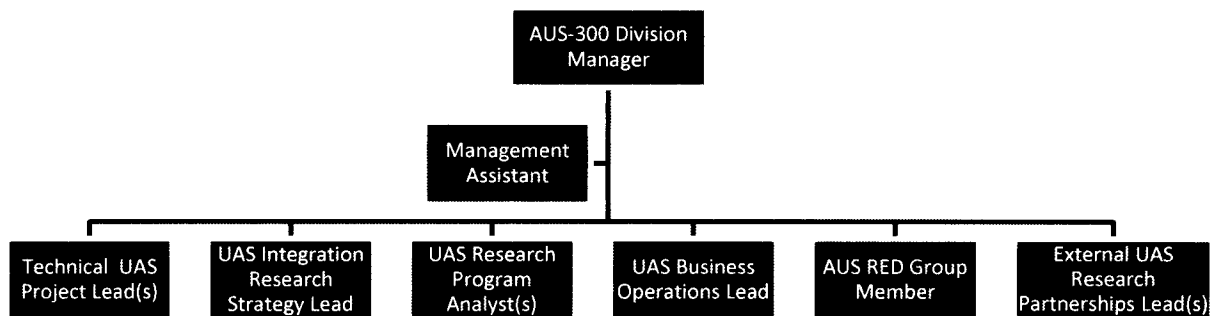


Figure 1: AUS-300 Functional Organization Chart

The responsibilities and tasking of these roles may include, but are not limited to, the following:

AUS-300 R&D Division Manager:

- Oversees entire division and delegates work accordingly
- Interfaces with AUS and FAA senior management on UAS R&D activities
- Oversees planning, execution, management of UAS research activities (both internal and external)
- Ensures the division has the appropriate resources in order to successfully fulfill its mission
- Facilitates completion of Congressional mandates, business plan items, implementation plan actions, and other high profile items that are dependent on research
- Strategically plans research activities based on key UAS integration milestones

Technical UAS Project Lead(s):

- Serve as subject matter experts on a wide variety of UAS integration challenges
- Oversee the planning and execution of individual R&D projects
- Interface with AUS and FAA subject matter experts, FAA research sponsors and performers, and other internal and external research partners
- Ensure that R&D projects are completed on time and on budget
- Ensure that research products will meet FAA UAS integration objectives

UAS Integration Research Strategy Lead:

- Develops strategy for UAS integration research based on FAA UAS integration objectives
- Assists FAA UAS stakeholders in identifying actionable research plans to support completion of UAS integration milestones
- Demonstrates alignment of current and planned UAS research to UAS integration milestones
- Ensures AUS-300 strategic direction aligns with FAA UAS integration requirements

UAS Research Program Analyst(s):

- Serve as an interface between AUS-300 and other FAA offices, including those within AUS, to foster the exchange of research results and technical data
- Serve as a subject matter expert on a wide variety of UAS challenges
- Document and track research project plans and results from research planning to execution to implementation of results

UAS Business Operations Lead:

- Leads the UAS R&D planning and coordination process
- Serves as the lead of the UAS TCRG
- Assembles FAA UAS research team and ensures membership represents the spectrum of UAS stakeholders across the FAA
- Facilitates meetings to foster the exchange of ideas and information
- Leads the team in identifying UAS research needs and available resources
- Establishes processes, methods, and tools for communicating, planning, executing, and managing UAS research across FAA LOBs

AUS Research, Engineering, and Development (RED) Group Member:

- Represents the needs and position of AUS on all interactions with AVS RED Group during all phases of the AVS R&D Process
- Ensures that UAS research needs are reflected in the AVS R&D portfolio
- Coordinates with all applicable UAS R&D stakeholders to ensure that AVS R&D process deliverables are accurate and consistent with FAA UAS integration milestones
- Ensures that all AVS R&D process deliverables are submitted in a timely manner and are of acceptable quality
- Coordinates with the UAS TCRG, the AVS RED Group, and across FAA LOBs to identify, plan, and submit the required documentation for RED funding for UAS research

- Communicates the progress of AVS UAS research with AUS-300

External UAS Research Partnerships Lead(s):

- Manage partnerships with external stakeholders
- Ensure that research conducted jointly between FAA and external partners will meet FAA UAS integration objectives
- Maintain awareness of UAS research programs and UAS integration challenges throughout government, industry, and academia
- Identify areas of opportunity and potential collaboration between the FAA and government, industry, and academia

UAS R&D Drivers, Influences, & Governance

FAA UAS research is both influenced and constrained by several factors. The documentation listed below includes governance, guidance, recommendations, and best practices.

FAA Strategic Plan for Integration of UAS into the NAS

The Strategic Priorities identified in the FAA Strategic Plan for Integration of UAS in the NAS³ depend on coordinated UAS research. These priorities are:

- (b) (5) [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]

Implementation Plan for Integration of UAS into the NAS

The Implementation Plan for Integration of UAS into the NAS⁴ documents how the FAA will accomplish the vision described in the UAS Strategic Plan. It describes the activities the FAA will perform over the next five years to enable the integration of UAS in the NAS. The Implementation Plan identifies specific challenges and presents them as actions for the FAA. AUS-300 is the primary focal point for several actions related to R&D, and is

³ FAA Strategic Plan for Integration of UAS in the NAS. March 8, 2016.

⁴FAA Implementation Plan for Integration of Unmanned Aircraft Systems (UAS) into the National Airspace System (NAS). FY2017 Implementation Plan. September 30, 2016.

responsible for their successful completion. AUS-300 also supports actions owned by other AUS and FAA offices when research is required. AUS-300 is responsible for ensuring that research efforts directly align to the challenges, needs, and actions identified in this plan.

Congressional Mandates

The FAA Extension, Safety, and Security Act of 2016⁵ seeks to improve aviation safety and includes thirteen mandates on UAS safety; AUS-300 is the AUS office of primary responsibility on several of these mandates, as summarized in Figure 2:

SECTION	SUMMARY	APPROACH	DUE DATE
2201	New Mexico State defined as a test site	(b) (5)	
2208	This section would authorize FAA, in coordination with the National Aeronautics and Space Administration, to develop a research plan and implement a pilot program for an unmanned aircraft system traffic management.		
2211	FAA, NASA, and stakeholders in industry and academia shall develop a roadmap of the estimates, schedules, and benchmarks for integrating UAS into the NAS. The roadmap shall include how to use research and development, assessments of abilities to integrate the UAS, and update on the advancement of various technologies.		
2212	The Administrator and NASA shall develop a program to conduct testing or modeling.		
2213	The Administrator will enter into an arrangement with the National Academies to study the potential use of probabilistic assessments of risk by the FAA to streamline the integration of UAS into the NAS.		

Figure 2: Summary of AUS-300's Congressional Mandates⁶

AUS-300 is responsible for developing and executing plans and coordinating with key stakeholders to fulfill these mandates by the deadlines set forth by Congress. AUS-300 may also act in a consulting role on other legislative items which require alignment with UAS research efforts.

AVS R&D Process

The AVS R&D team maintains an internal process for the planning and management of AVS RED activities. The Aviation Safety R&D Prioritization Process⁷ outlines requirements for:

⁵ <https://www.congress.gov/114/bills/hr636/BILLS-114hr636enr.pdf>

⁶ OMB R&D Briefing. November 17, 2016.

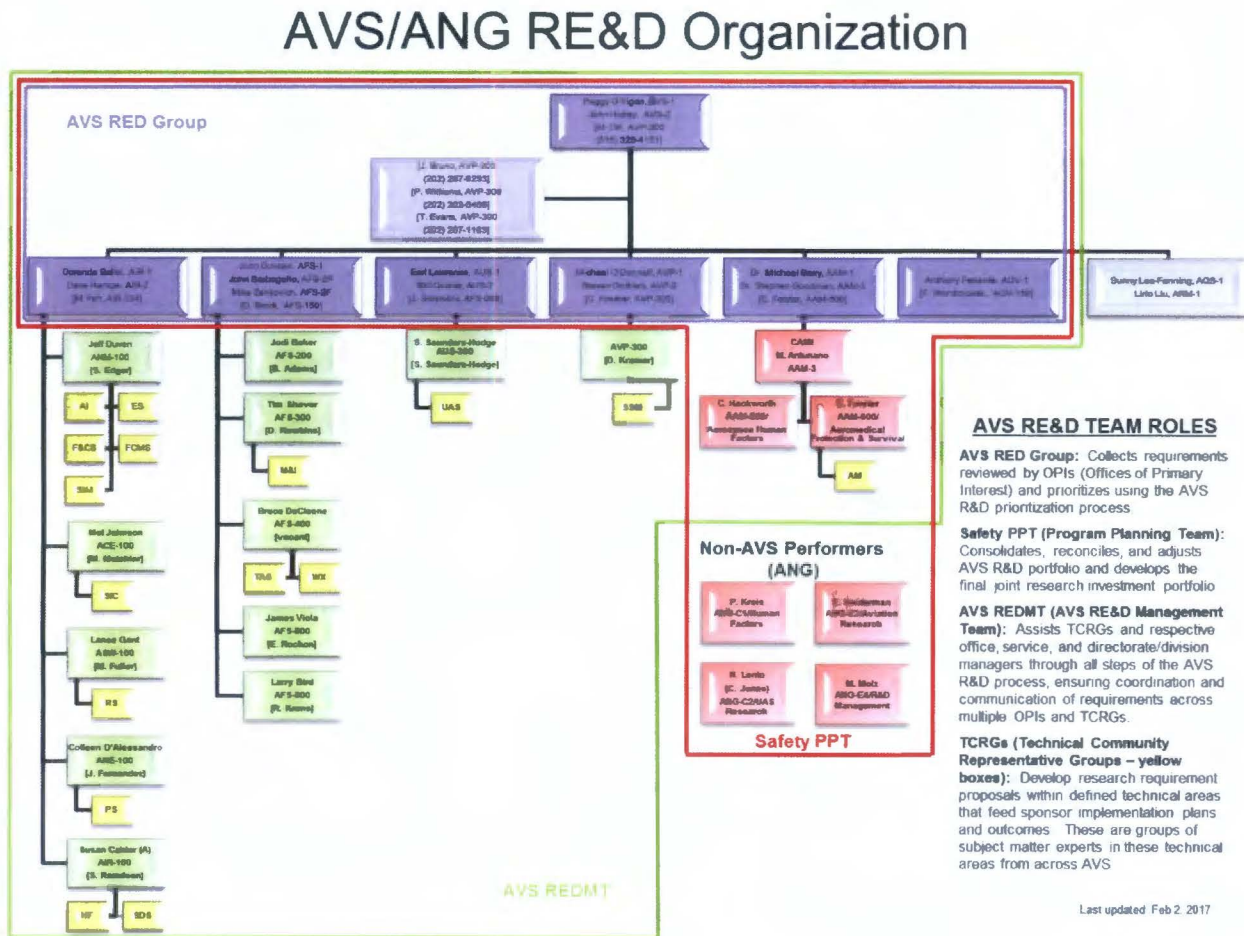
⁷ Aviation Safety R&D Prioritization Process 2013.

<https://avssp.faa.gov/avs/aviationsafetyresearch/AVS%20RD%20Process/Aviation%20Safety%20RnD%20Prioritization%20Process%202013%20FINAL%2020130410.pdf?Web=1>

- Developing, submitting, ranking, and evaluating research needs
- Providing cost estimates and budget programming for proposed research
- Coordinating within AVS S/Os to balance research priorities to develop a research portfolio that aligns with AVS mission needs and ultimately is approved by the Associate Administrator for Aviation Safety, AVS-1

UAS research that receives RED funding and directly supports the safe integration of UAS in the NAS falls within the AVS research portfolio, and is therefore guided by the AVS R&D process. This process also accounts for unbudgeted research, which may result from unexpected changes in priorities or in response to a new Congressional mandate or executive direction. The process document identifies individual roles and responsibilities inherent to the execution and management of the process. Figure 3 shows the organization of Research, Engineering, and Development (RE&D) resources.

Figure 3: AVS/ANG RE&D Organization⁸



⁸ AVS RED Teams 2014. February 23, 2017.

AUS-300 provides representation to the AVS RED Group, with the responsibility of interfacing with the R&D team, other RED Group members, the Safety Program Planning Team, and research sponsors and performers on behalf of AUS. AUS-300 also provides a business operations lead that leads the UAS TCRG and is responsible for coordinating FAA UAS research needs through the processes to align research to existing FAA UAS integration priorities and to identify funding sources.

AUS-300 must effectively manage resources in order to comply with AVS R&D process schedules. A notional AVS R&D process schedule, below in Figure 4, depicts the general timeframes of key AVS R&D deliverables and significant events.

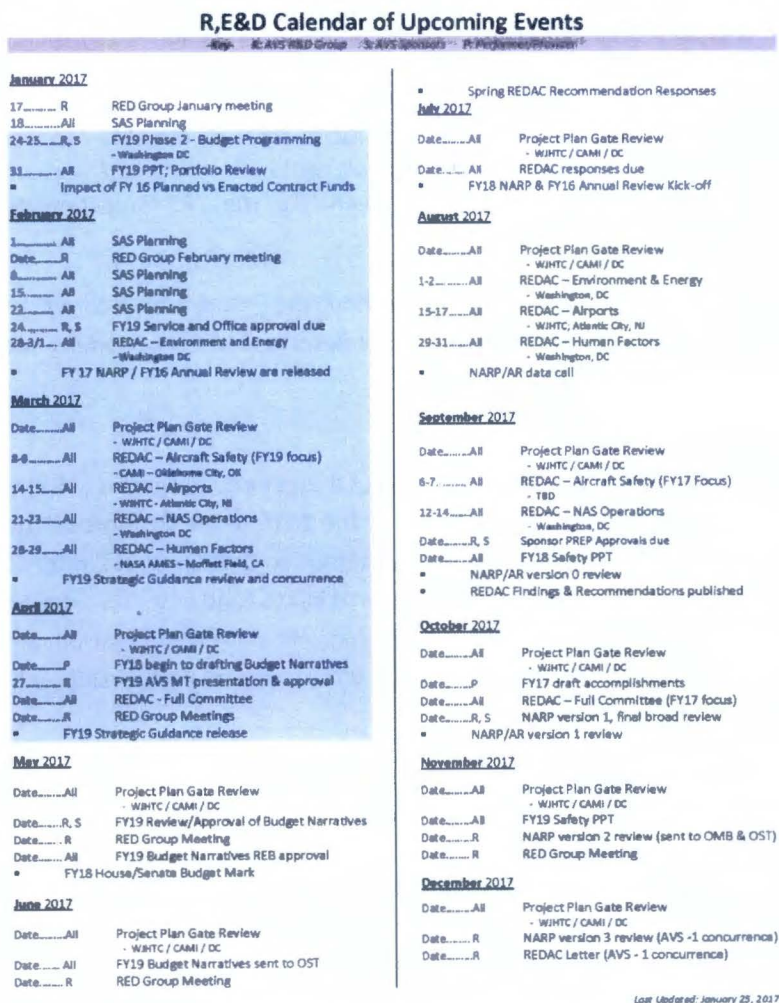


Figure 4: RE&D Calendar of Upcoming Events⁹

⁹ <https://avssp.faa.gov/avs/aviationsafetyresearch/SitePages/Home.aspx>. January 25, 2017.

AVS R&D Strategic Guidance

Each year, AVS-1 issues the AVS R&D Strategic Guidance¹⁰ to formally initiate the research needs development process within AVS. This document outlines key aviation safety considerations and data sets that may assist AVS S/Os in identifying research needs.

AUS-300 is responsible for ensuring that UAS considerations are appropriately documented in the Strategic Guidance. AUS-300 also coordinates the AUS review and concurrence of the Strategic Guidance prior to AVS-1 signature.

The Strategic Guidance package also documents changes to the existing AVS R&D process. The FY19 Strategic Guidance was the first to document the following change to UAS integration research:

***Development of UAS Research Proposals:** In accordance with Section 4.3 of the 2013 Aviation Safety R&D Prioritization Process and in alignment with the mission of the UAS Integration Office, from this time forward all research proposals for Aviation Safety RE&D funding related to the safe integration of UAS in the NAS must be made through the UAS TCRG. This includes all new research proposals for FY19 and beyond as well as unbudgeted requests from now forward. This will ensure proper coordination between all of the UAS subject matter experts, in keeping with the function of the TCRG.*

AUS-300 continues to communicate this message throughout the FAA research community, and has adopted internal processes in order to implement this guidance, as described in the upcoming section, The Scope of AUS-300.

AFN Determination of RED Funds

The Capital Budgets Division (ABP-330) within the Office of Budget and Programs (ABP) provides financial support services for AVS-funded research. In response to the 2016 research appropriation from Congress, ABP-330 and the Office of Finance and Management (AFN) determined that Congress' intent for research funded under the A11L budget line item (BLI) was for this appropriation to fund any UAS safety-related research, including research sponsored by other FAA LOBs. In keeping with this determination, a research sponsor from any LOB may propose UAS integration research. AUS-300 will forge new partnerships with other FAA LOBs for UAS integration research of common interest.

Service Level Agreement (SLA)

The Service Level Agreement (SLA) between Aviation Safety (AVS) and NextGen (ANG) for Research and Development Services¹¹ is an agreement between AVS ("Sponsor") and the NextGen Office (ANG) ("Performer") that clarifies responsibilities for operation and funding of the AVS R&D Program. It is signed by AVS-1 and ANG-1. The purpose of the SLA is to:

- Establish the roles and responsibilities of AVS and ANG, as the Sponsor and Performer (specifically ANG-C and ANG-E), respectively, of the FAA's AVS sponsored research BLIs. The success of AVS research is dependent on the collaborative activities of AVS and ANG as described in this SLA.

¹⁰ AVS Research & Development Strategic Guidance. May 19, 2016.

¹¹ Service Level Agreement between Aviation Safety (AVS) and NextGen (ANG) for Research and Development Services. March 7, 2012.

- Establish overall rules of engagement, mechanisms, and procedures to be used by the Sponsor and the Performer in conducting AVS R&D.

Specifically, this agreement sets forth an agreed-to plan that identifies roles and responsibilities in accomplishing key products and deliverables within the AVS R&D process. AUS-300 is responsible for coordinating these products and deliverables as they apply to UAS research in a timely manner and in accordance with this agreement. This may include reaching out to both sponsors and performers to ensure a coordinated response on research documentation that is up to date and consistent with the latest UAS research plans.

National Aviation Research Plan

The National Aviation Research Plan (NARP)¹² is the FAA's performance-based plan to ensure that R&D investments are well-managed, deliver results, and sufficiently address near-, mid-, and far-term national aviation priorities¹³. The NARP outlines R&D principles and goals that align with the strategic visions laid out by the President, the Secretary of Transportation, and the FAA Administrator. This approach enables the FAA to address the challenges of operating the safest, most efficient air transportation system in the world while building a foundation for the future system in an environmentally sound manner.

AUS-300 participates throughout NARP development process, from the initial data call, to iterative review cycles, and then through final vetting and approval by AVS-1. AUS-300 ensures that the AUS R&D plan is accurately reflected in the NARP.

The FY17 NARP Development and Review Process¹⁴ reflects major tasks in the development cycle, as shown in Figure 5.

¹²

https://www.faa.gov/about/office_org/headquarters_offices/ang/offices/tc/about/campus/faa_host/RDM/media/pdf/2016NARP.pdf

¹³ https://www.faa.gov/about/office_org/headquarters_offices/ang/offices/tc/about/campus/faa_host/RDM/

¹⁴ NARP Development Cycle: "Welcome to the 2017 National Aviation Research Plan & FY2016 R&D Annual Review Kick-Off." July 21, 2016.

Major Task	Start Date	End Date	Business Days
Kickoff/Instructional Meeting (WJHTC then HQ)	07/21/16	07/26/16	4
Contributors Complete Data Call Spreadsheets	07/27/16	08/09/16	10
NARP Team Creates V0	08/10/16	08/24/16	11
Version 0 Review (ANG-E4 Management/Contributor/Broad Agency review)	08/25/16	09/08/16	10 Labor Day Mon 9.5
NARP Team Creates V1	09/09/16	09/30/16	16
Version 1 Review and Concurrence (ANG Directors, ANG-1/2, REB and Final Broad Agency Review)	10/03/16	10/21/16	14 Columbus Day Mon 10/10
NARP Team Creates V2	10/24/16	11/10/16	14 Election Day Tues 11/8 Veterans Day Fri 11/11
Release Version 2 for Informal OMB and OST Review + concurrent ANG Directors and ANG-1/2 Re-Review	11/14/16	12/05/16	15 Thanksgiving Day Thurs 11/24
Version 2 Updated per OMB and OST Feedback	12/06/16	12/14/16	7
<i>Assumptions:</i>			
- Minimal OMB and OST changes			
- Go back out to programs for edits as necessary based on OMB/OST feedback			
- Addition of final budget numbers per OMB passback*			
Version 3 Final Review and Concurrence (ANG-E, ANG-1/2, and LOBs)	12/15/16	12/28/16	10
Version 3 Review and Approval (AOA-1)	12/29/16	01/13/17	12
Version 3 Review and Concurrence (OST and OMB)	01/17/17	02/01/17	12 Martin Luther King Jr Day 1/16/2017

Figure 5: FY17 NARP Development and Review Process

Budget Narratives

Budget narratives are submitted on an annual basis to the Office of the Secretary of Transportation (OST) and to the Office of Management and Budget (OMB). Budget narratives accompany budget requests and identify research to be performed, proposed research funding levels, and expected accomplishments. Budget narratives document the FAA’s formal research plans to Congress on how research funding shall be used. The FAA is therefore committed to completing the work stated in a timely manner. The FAA NextGen Research & Development Division, ANG-E4, leads the budget narrative development process and works across the FAA’s research portfolios to incorporate input on research programs. For UAS budget narratives, AUS-300 is responsible for coordinating input with stakeholders, including research sponsors, performers, and appropriate AUS personnel, in a timely manner to ensure UAS research plans are accurately reflected.

Research, Engineering, and Development Advisory Committee

The FAA’s Research, Engineering and Development Advisory Committee (REDAC) advises the Administrator on research and development issues. It also assists in ensuring the FAA’s R&D activities are coordinated with industry and other government agencies. The REDAC has five subcommittees:

- NAS Operations
- Airports
- Aircraft Safety

- Human Factors
- Environment and Energy

Because UAS integration presents challenges that span multiple research portfolios, any subcommittee may address UAS issues and provide UAS research recommendations. The Subcommittee for Aircraft Safety (SAS) has the primary responsibility for providing UAS research recommendations, because the UAS research portfolio resides within aircraft safety. The AVS R&D team leads the process in responding to all official inquiries and recommendations from the REDAC regarding AVS-sponsored research, including those within the UAS research portfolio. The AVS R&D team relies on AUS to provide responses to UAS items. AUS-300 leads the AUS R&D response development and works with corresponding offices provide a cohesive response that is consistent with UAS integration plans. AUS-300 may also present UAS research plans to the SAS upon request.

NAS Enterprise Architecture (EA) and NAS Segment Implementation Plan (NSIP)

The NAS EA and NSIP indicate the developmental timelines and resources required to achieve desired changes in the FAA's NAS enterprise architecture and NextGen programs. AUS-300 will work with other AUS divisions to provide ANG with key supporting research for NAS EA roadmaps and the NSIP.

UAS R&D Roadmap

Annual revisions to the UAS R&D Roadmap will identify up-to-date UAS integration goals, metrics and milestones. AUS-300 will update this Roadmap on a regular basis and will coordinate across FAA LOBs and with external partners as needed to identify research needed to achieve these goals. AUS-300 will collaborate with stakeholders to identify resources for research efforts identified in the Roadmap.

The Scope of AUS-300

UAS Research Internal to the FAA

AUS-300 coordinates the UAS Integration Research Planning Process illustrated in Figure 6:

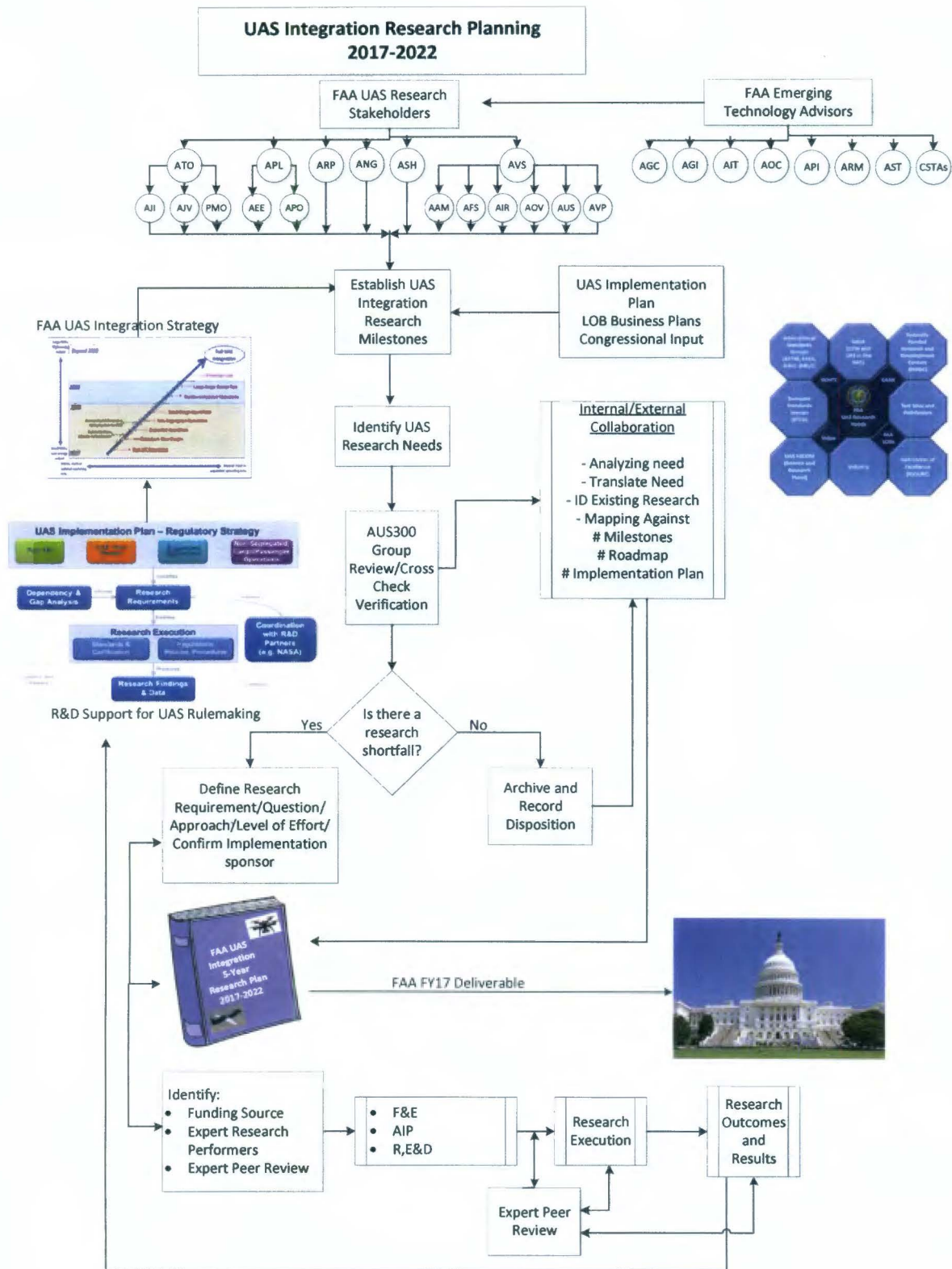


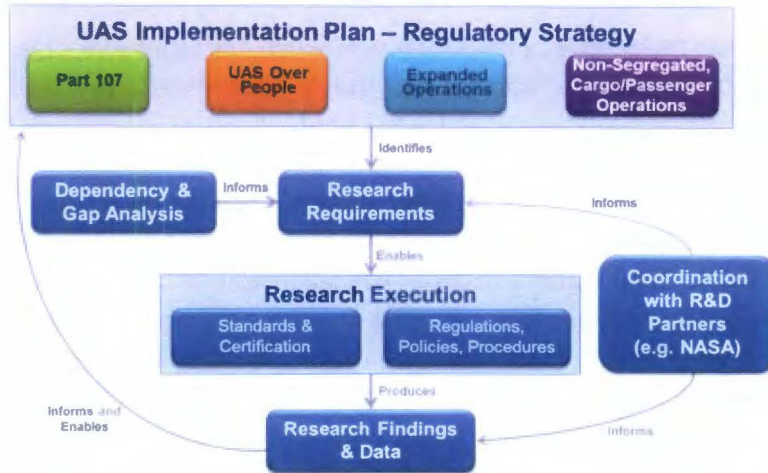
Figure 6: UAS Integration Research Planning

This process is intended to take place *before* any existing research processes, for example, the AVS R&D process. The overarching goal is for AUS-300 to assist LOBs in identifying research in support of UAS milestones. Once clear alignment between the research need and UAS integration milestones is established, UAS-300 may assist the LOB in determining the best path forward for research execution. It is at this point where existing processes would take place.

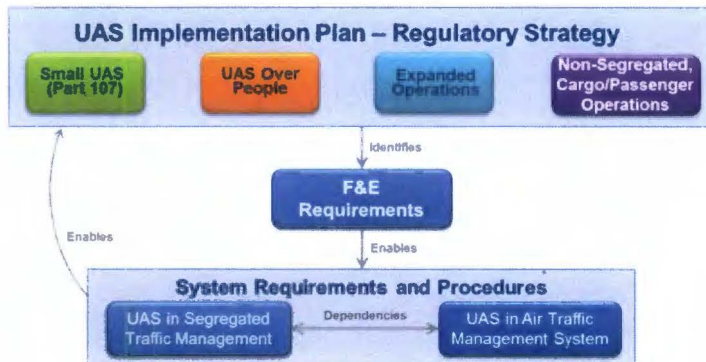
In greater detail, when an FAA LOB identifies a need for UAS research, the sponsoring organization may submit the need to AUS-300. AUS-300 analyzes the need and translates it into a research plan. This could involve identifying the desired outcome and working backwards to identify all the steps necessary to achieve that outcome. AUS-300 then compares that need to existing UAS research efforts and results from within the FAA and other partners. If similar work already exists, AUS-300 assists the sponsoring organization in contacting the research performer for potential partnering or information exchange; if not, AUS-300 compares it to the FAA's UAS Implementation Plan and to other critical milestones needed to achieve safe, efficient, and timely UAS integration. Figure 7 illustrates support for UAS Rulemaking. The UAS Integration Research Planning Process enables identification of the requirements that support the UAS Implementation Plan and regulatory strategy.

Figure 7: Support for UAS Rulemaking¹⁵

R&D Support for UAS Rulemaking



F&E Support for UAS Rulemaking



AUS-300 and the sponsoring organization determine the funding source for the work. The FAA accounts which may fund research are: Research, Engineering and Development (RED); Facilities & Equipment (F&E); and Airport Improvement Program (AIP). If the proposed research does not support UAS integration based on the above analysis, then that decision is documented and the research plan is archived.

RED Funding

Typically, the FAA's UAS research portfolio is funded via the FAA's RE&D account. Order 2500.8B Funding Criteria for Operations, Facilities and Equipment (F&E), and Research, Engineering, and Development (R,E,&D) Accounts¹⁶ states "the RE&D account funds the research and development (R&D) programs that improve the National Airspace System (NAS) by increasing its safety, security, productivity, capacity, and environmental

¹⁵ FAA Unmanned Aircraft System (UAS) Research & Development Updates. FAA/NASA Quarterly Meeting. November 18, 2016

¹⁶ <http://www.faa.gov/documentLibrary/media/directives/nd/ND2500-8B.pdf>

compatibility to meet the expected NAS demands of the future.” RE&D funding for UAS research comes through the A11L BLI within the AVS research portfolio. Therefore all UAS research within the A11L BLI is subject to the AVS R&D process. Per the Strategic Guidance, all UAS research must be coordinated through the UAS TCRG. The UAS TCRG, led by AUS-300, is the central gathering point for all UAS research within the A11L BLI, and facilitates UAS research through the AVS R&D process. Also per the guidance from ABP, AVS RED funding may be used for research that supports FAA UAS integration needs.

The primary sponsor is the organization who will implement the research results towards achieving an outcome that supports safe, efficient, and timely UAS integration. A sponsor with a research need should approach UAS TCRG and begin the process described in Figure 6. If it is then determined that RED funding is appropriate, the proposed research plan would enter the AVS R&D Prioritization Process.

AUS-300 will also develop partnerships as appropriate and to secure additional resources, funding, or equipment as needed to get the research done. AUS-300 provides technical project leads who actively work with both research sponsors and performers to ensure that the work will meet sponsor objectives for UAS and will be done according to time and budget constraints.

F&E Funding

The Facilities and Equipment (F&E) account funds capital investments related to air navigation facilities and equipment and aviation safety systems, including acquisition costs, installation, testing, initial spares, initial maintenance contracts and training for equipment, facilities, and other construction projects. AUS-300 will actively track, participate, and coordinate with stakeholders on any F&E-funded research in order to ensure the work meets critical UAS integration milestones.

AIP

The AIP account funds planning, development, and administrative costs of a safe and efficient national airport system to satisfy the needs to the aviation interests of the United States.

AUS-300 will work with the Airports LOB (ARP) to determine whether AIP funding would be appropriate. AUS-300 will actively track, participate, and coordinate with stakeholders on any AIP-funded research in order to ensure the work meets critical UAS integration milestones.

The Airport Cooperative Research Program (ACRP) is an industry-driven, applied research program that develops practical solutions to problems faced by airport operators¹⁷. AUS-300’s role of UAS integration research management is to connect, facilitate, and stimulate the research interests and interchanges among FAA offices, including ARP. AUS-300 will actively track, participate, and coordinate with stakeholders on any UAS-related ACRP research in order to ensure the work meets critical UAS integration milestones.

¹⁷ <http://www.faa.gov/airports/acrp/>

compatibility to meet the expected NAS demands of the future.” RE&D funding for UAS research comes through the A11L BLI within the AVS research portfolio. Therefore all UAS research within the A11L BLI is subject to the AVS R&D process. Per the Strategic Guidance, all UAS research must be coordinated through the UAS TCRG. The UAS TCRG, led by AUS-300, is the central gathering point for all UAS research within the A11L BLI, and facilitates UAS research through the AVS R&D process. Also per the guidance from ABP, AVS RED funding may be used for research that supports FAA UAS integration needs.

The primary sponsor is the organization who will implement the research results towards achieving an outcome that supports safe, efficient, and timely UAS integration. A sponsor with a research need should approach UAS TCRG and begin the process described in Figure 6. If it is then determined that RED funding is appropriate, the proposed research plan would enter the AVS R&D Prioritization Process.

AUS-300 will also develop partnerships as appropriate and to secure additional resources, funding, or equipment as needed to get the research done. AUS-300 provides technical project leads who actively work with both research sponsors and performers to ensure that the work will meet sponsor objectives for UAS and will be done according to time and budget constraints.

F&E Funding

The Facilities and Equipment (F&E) account funds capital investments related to air navigation facilities and equipment and aviation safety systems, including acquisition costs, installation, testing, initial spares, initial maintenance contracts and training for equipment, facilities, and other construction projects. AUS-300 will actively track, participate, and coordinate with stakeholders on any F&E-funded research in order to ensure the work meets critical UAS integration milestones.

AIP

The AIP account funds planning, development, and administrative costs of a safe and efficient national airport system to satisfy the needs to the aviation interests of the United States.

AUS-300 will work with the Airports LOB (ARP) to determine whether AIP funding would be appropriate. AUS-300 will actively track, participate, and coordinate with stakeholders on any AIP-funded research in order to ensure the work meets critical UAS integration milestones.

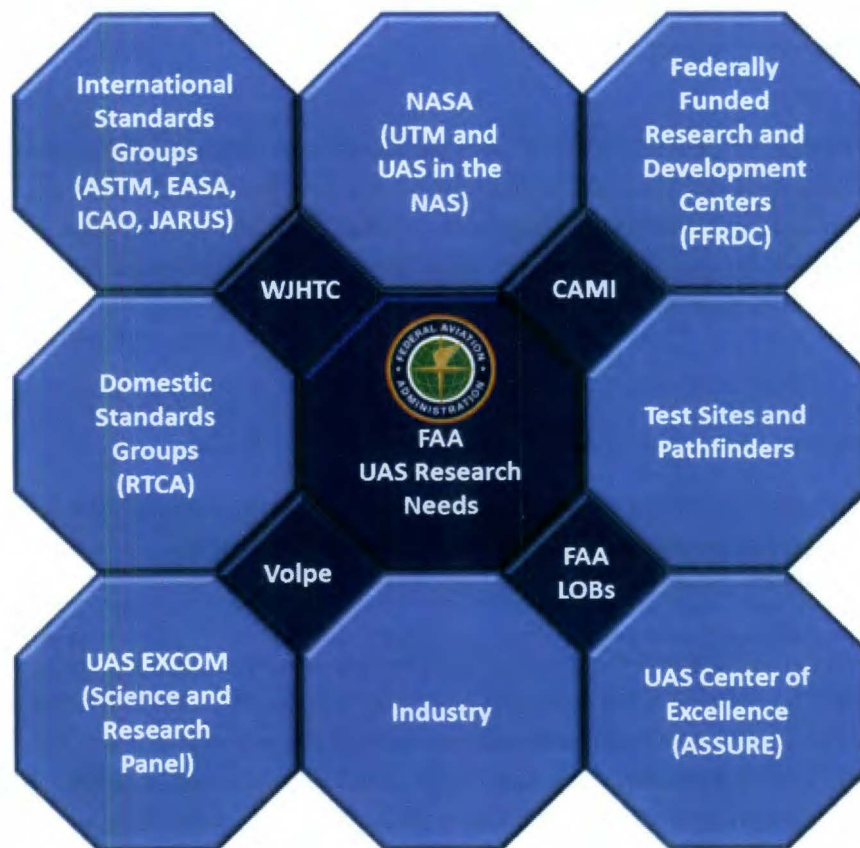
The Airport Cooperative Research Program (ACRP) is an industry-driven, applied research program that develops practical solutions to problems faced by airport operators¹⁷. AUS-300’s role of UAS integration research management is to connect, facilitate, and stimulate the research interests and interchanges among FAA offices, including ARP. AUS-300 will actively track, participate, and coordinate with stakeholders on any UAS-related ACRP research in order to ensure the work meets critical UAS integration milestones.

¹⁷ <http://www.faa.gov/airports/acrp/>

UAS Research with External Partners

AUS-300 plays a significant role in integrating the UAS research of partners outside the FAA. AUS-300 works to include or combine relevant research from external partners to support FAA UAS integration needs. This section describes how AUS-300 works with external partners to leverage resources, equipment, and capabilities to meet the research needs of multiple UAS stakeholders. It is important to note that other FAA LOBs, such as ANG, have significant roles in establishing and maintaining agreements and gathering information from external partners. AUS-300 works with ANG and other LOBs to integrate external partner research and provide relevant products for FAA policy, regulatory and programmatic needs. Figure 8 illustrates some of the FAA's UAS R&D partnerships. External partnerships are represented in light blue; internal partnerships are represented in dark blue.

Figure 8: FAA UAS R&D Partnerships



National Aeronautics and Space Administration

The National Aeronautics and Space Administration (NASA) is a key partner in UAS integration research. NASA's two key UAS integration research programs are the "UAS in the NAS" and "Low Altitude UAS Traffic Management" research. AUS-300 provides subject matter experts to participate in these NASA research efforts to ensure FAA research objectives are sufficiently addressed. AUS-300 may also identify potential areas of research collaboration, as well as communicate NASA research needs and capabilities to FAA UAS research forums.

NASA UAS in the NAS Research

NASA started its “UAS in the NAS” Project in May of 2011 to “contribute capabilities that reduce technical barriers related to the safety and operational challenges associated with enabling routine UAS access to the NAS”¹⁸. NASA research technology development areas have an impact timeframe of 2015 to 2025 and include:

- Separation Assurance
- Human Systems Integration
- Communications
- Certification
- Integrated Test and Evaluation

As research products are developed, FAA and NASA must ensure the relevant reports are delivered to FAA regulatory and policy makers. Much of the NASA UAS in the NAS project work has already directly supported RTCA Special Committee 228 development of minimum operational performance standards (MOPS) for UAS Control and Non-Payload Communications and Detect and Avoid (DAA).

NASA Low Altitude UAS Traffic Management (UTM)

In 2015, NASA began research on technology and procedures to enable civil UAS operations in low altitude airspace. The FAA has established a Research Transition Team (RTT) with NASA to leverage NASA work to identify airspace operations requirements that can enable large-scale UAS operations in low altitude airspace within and beyond visual line of sight. The FAA and AUS-300 will engage in this RTT with NASA to integrate this research to meet the FAA’s established and emerging research needs for low altitude operations.

UAS Center of Excellence

In May of 2015, the FAA selected the Alliance for System Safety of UAS through Research Excellence (ASSURE) to be the FAA’s Center of Excellence (COE) for UAS. This team of universities is led by Mississippi State University and focuses on several areas of research including: DAA technology, low-altitude operations safety, control and communications, spectrum management, human factors, compatibility with air traffic control operations and training and certification of UAS pilots and crew¹⁹. Research conducted through the UAS COE is cost-effective because the COEs are required by Congress “to match federal grants awarded for public purpose to establish, operate and conduct research”²⁰.

Any FAA LOB can sponsor COE research. Other government research organizations can also sponsor research with federal grants that the COE will match with appropriate resources. NextGen’s New Entrants Division, ANG-C2, has the program management responsibility for UAS COE research. AUS-300 will work with ANG-C2 and other LOBs to ensure UAS COE research supports integration needs as defined in implementation and business plans.

¹⁸ NASA’s UAS NAS Access Project, 2011.

¹⁹ FAA Press Release on UAS COE Selection, 8 May 2015.

²⁰ FAA Center of Excellence for Unmanned Aircraft Systems Final Solicitation, 12 August 2014.

The UAS COE may also conduct research funded entirely by industry. AUS-300 will work with ANG-C2 to identify industry-funded research that supports FAA integration needs and bring this research to the attention of FAA rulemaking, policy and guidance developers to meet their information needs.

UAS Test Sites

The FAA has fulfilled the congressional mandate of the FAA Modernization and Reform Act of 2012²¹ on the establishment of UAS Test Sites. There are seven Test Sites today that have made significant progress on their operations and have maintained operational data collection to support UAS integration. AUS-300 cooperates with Test Sites on UAS research activities that align with UAS integration milestones.

Pathfinder Research

The FAA has developed pathfinder programs to explore next steps in UAS operations, beyond the operations authorized in the small UAS rule, Part 107. The focus areas are:

- UAS in visual line of sight over people
- UAS in extended visual line of sight in rural areas
- UAS beyond visual line of sight in rural areas
- Airport Detection and Mitigation

The UAS Safety and Integration Division, AUS-400, manages FAA pathfinder in collaboration with individual project managers for each initiative from AUS and other LOBs. AUS-300 supports AUS-400 with research requirements and may assist in identifying and securing funding sources.

AUS-300 will work with FAA pathfinder partners in AUS and other LOBs to ensure that reports and other results of pathfinder research and development activities are documented and available to FAA regulatory and policy developers.

Executive Committee SAA Science and Research Panel (SARP)

The Sense & Avoid (SAA) Science and Research Panel (SARP) was established within the Office of the Secretary of Defense in 2011. Initially, this forum was limited to the Department of Defense and its research partners. In June of 2013, the Executive Committee Senior Steering Group decided to expand the SARP to include the FAA. The FAA has been a key SARP partner ever since.

The SAA SARP has a range of government research partners who hold monthly meetings to discuss the status of common research priorities and progress in addressing research gaps. Research priorities may be of interest to public UAS operations or to civil operations. In many cases, research serves both interest areas.

AUS-300 maintains awareness of all SARP research and may provide subject matter expertise to participate.

RTCA Special Committee 228 (SC-228)

RTCA SC-228 for UAS is working to develop MOPS for DAA equipment and for a Command and Control Data Link establishing L-Band and C-Band solutions. AUS-300 provides subject matter expertise to the SC-228 and its sub-groups, and monitors the progress, events, and products of the committee. Committee products may require data, validation and verification, modeling, and other tools or techniques supported by research. AUS-300 works

²¹ <https://www.congress.gov/bill/112th-congress/house-bill/658/text>

with committee members to identify these needs, and if necessary, incorporate them into the UAS Integration Research Planning process.

International

The FAA has established an international governance structure to guide, direct, and accelerate execution of the goals and objectives identified for global leadership in aviation and aerospace. This structure is led by FAA Office of International Affairs (API) and includes membership from all over the FAA, including AUS. The International Advisory Board coordinates among members to make transparent and data-informed decisions, and oversees implementation of the FAA's International Strategy formulated by the International Steering Committee. AUS-300 works with the AUS international Division, AUS-200, and with API to integrate UAS research needs into international efforts, and to leverage ongoing research and results when applicable.

The FAA and foreign governments may sign research agreements or recognize research affiliations between research universities to advance common UAS research needs. Current formal and informal collaborative research relationships are noted in this section. AUS-300 works these coordination actions through AUS-200 and API.

The UAS COE is affiliated with universities in other countries. While research supported by these partner universities may not be research from a foreign government, the addition of foreign universities typically requires recognition of the new affiliation by both the FAA and the host nation for the UAS COE university. AUS-300 works this coordination through AUS-200.

The FAA continues to engage with regulatory authorities throughout the world to achieve its global leadership initiatives through education and outreach. As FAA research and regulatory initiatives become known, other nations will seek FAA research results and provide relevant research that may support existing research results. AUS-300 will coordinate with AUS-200 to share FAA and partner research that supports UAS integration needs and related global leadership initiatives.

Moving Forward

AUS-300 has committed to working with the AVS RED Group on its effort towards evolving the AVS R&D Prioritization Process. This effort, known as "R&D Process Evolution," will be characterized by multi-year project plans with integrated change logs and task funding details, as opposed to the single year research requirement documents that are physically separated from any changes or updates and cost information. AUS-300 will develop "project-based" plans for FY17, in conjunction with the established process. This parallel effort will help to inform the evolution effort and will aid in the transition of the new process across the AVS research community.

AUS-300 is also committed to more effectively managing the outcomes and implementations of UAS research results. AUS-300 will work with research sponsors to develop detailed project plans that support a critical UAS integration outcome. These steps will align with the FAA's UAS integration plans such as the Implementation Plan and research roadmap. As research progresses and products delivered, AUS-300 will work with the sponsors and monitor the implementation of the results. AUS-300 will also capture lessons learned and will

modify its internal processes and documents as needed in order to most effectively collaborate across the FAA and research partners in order to meet UAS integration milestones.

AUS-300 will continue to evaluate this Research Management Plan to determine any updates needed. Any changes to current processes, documentation, research methods and tools, stakeholders and partners, and AUS-300 roles and interactions, will be reflected in subsequent versions of this document.

Appendices

Appendix A: 1100 Order Announcing Establishment of Unmanned Aircraft Systems Integration Office (AUS)

U.S. Department of Transportation Federal Aviation Administration Order N1100.XXX. Aviation Safety Organizational Change.

NOTICE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

N 1100 XXX

National Policy

Effective Date:
Mon. Day, YYYY

Cancellation Date:
Mon. Day, YYYY

SUBJ: Aviation Safety Organizational Change

1. Purpose of the Notice. This notice announces the establishment of the Unmanned Aircraft Systems Integration Office (AUS) as an office reporting to the Associate Administrator for Aviation Safety (AVS).

2. Audience. The audience for this notice includes all employees within the Federal Aviation Administration (FAA).

3. Where can I find this notice? You can find this notice on the MyFAA employee website at https://employees.faa.gov/tools_resources/orders_notices. This notice is available to the public at http://www.faa.gov/regulations_policies/orders_notices.

4. Background. This organizational change permits the FAA to fulfill its responsibilities to the aviation community by enabling the integration of unmanned aircraft systems (UAS) into the National Airspace System (NAS). Strategic initiatives for UAS are in the Office of the Administrator Business Plan, the AVS Business Plan, and the Air Traffic Organization (ATO) Business Plan. Research and demonstration projects for UAS are prominently featured in the NextGen Implementation Plan and the National Aviation Research Plan. This office was formerly the Flight Standards Service (AFS) UAS Integration Office, AFS-80.

5. New Organizational Structure and Functions. AUS is composed of an executive Director, Deputy Director, four individual divisions, and a separate office reporting to the Deputy Director. AUS is responsible for supporting the development and implementation of regulations, policies, procedures, guidance, and standards that govern UAS operation, and the safe integration of UAS into the NAS. The Office is also responsible for facilitating the development of policies, standards, and requirements for training related to existing and emerging UAS technology. AUS coordinates with all Lines of Business (LOBs) and Staff Offices (SOs), ensuring harmonization of all UAS integration efforts within the FAA.

a. Mission. AUS is responsible for facilitating the safe, efficient, and timely integration of UAS into the NAS.

NOTICE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

N 1100.XXX

National Policy

Effective Date:
Mon. Day, YYYY

Cancellation Date:
Mon. Day, YYYY

SUBJ: Aviation Safety Organizational Change

1. **Purpose of the Notice.** This notice announces the establishment of the Unmanned Aircraft Systems Integration Office (AUS) as an office reporting to the Associate Administrator for Aviation Safety (AVS).

2. **Audience.** The audience for this notice includes all employees within the Federal Aviation Administration (FAA).

3. **Where can I find this notice?** You can find this notice on the MyFAA employee website at https://employees.faa.gov/tools_resources/orders_notices. This notice is available to the public at http://www.faa.gov/regulations_policies/orders_notices.

4. **Background.** This organizational change permits the FAA to fulfill its responsibilities to the aviation community by enabling the integration of unmanned aircraft systems (UAS) into the National Airspace System (NAS). Strategic initiatives for UAS are in the Office of the Administrator Business Plan, the AVS Business Plan, and the Air Traffic Organization (ATO) Business Plan. Research and demonstration projects for UAS are prominently featured in the NextGen Implementation Plan and the National Aviation Research Plan. This office was formerly the Flight Standards Service (AFS) UAS Integration Office, AFS-80

5. **New Organizational Structure and Functions.** AUS is composed of an executive Director, Deputy Director, four individual divisions, and a separate office reporting to the Deputy Director. AUS is responsible for supporting the development and implementation of regulations, policies, procedures, guidance, and standards that govern UAS operation, and the safe integration of UAS into the NAS. The Office is also responsible for facilitating the development of policies, standards, and requirements for training related to existing and emerging UAS technology. AUS coordinates with all Lines of Business (LOBs) and Staff Offices (SOs), ensuring harmonization of all UAS integration efforts within the FAA.

a. **Mission.** AUS is responsible for facilitating the safe, efficient, and timely integration of UAS into the NAS.

Appendices

Appendix A: 1100 Order Announcing Establishment of Unmanned Aircraft Systems Integration Office (AUS)

U.S. Department of Transportation Federal Aviation Administration Order N1100.XXX. Aviation Safety Organizational Change.

b. **UAS Integration Office (AIUS).** The UAS Integration Office is responsible for the following functions:

- 1) Supports the development, implementation, and maintenance of regulations, policies, guidance, requirements, criteria, and procedures for new system evaluations, integration, and implementation of emerging UAS technologies.
- 2) Identifies requirements, coordinates regulations and guidance, and provides support and technical assistance for policies and procedures for safe operations, training, and integration of new UAS flight systems; participates in regulatory review programs; and provides safety risk mitigations to support the grant or denial of UAS Certificates of Waiver or Authorization (COA) or exemptions.
- 3) Determines UAS research needs, and proposes UAS research requirements; assists in establishing the Agency's UAS research priorities; provides guidance to UAS research and development (R&D) programs for AVS; supports similar functions for FAA and government UAS research partners in collaboration with AVS.
- 4) Supports the development of guidance and policy to all Agency organizations regarding the implementation of new and existing UAS technologies; advises on application of Agency policies, standards and procedures as they relate to implementation of new UAS flight technologies and safety enhancement programs.
- 5) Represents the FAA at domestic and international meetings to further U.S. interests, and supports the development of international standards, practices and procedures.
- 6) Supports development, and recommends and coordinates regulatory and policy actions to resolve flight safety problems associated with UAS technologies and procedures as identified through system analysis, accident, incident, or other system reports.
- 7) Develops and implements communications and outreach/educational initiatives in support of safe UAS integration into the NAS.

- 8) Coordinates with other LOBs and SOs to leverage expertise to ensure overall safety and risk-based integration goals are being met, with consideration for the potential impact on manned aviation.
- 9) Coordinates FAA UAS Integration Strategy and assists other FAA organizations in identifying and tracking their progress toward meeting commitments to support the achievement of strategy goals and milestones.

c. Director (AUS-1). The Director is responsible for the overall management of activities within AUS.

d. Deputy Director (AUS-2). The Deputy Director oversees management of all divisions of AUS and the Executive Office. The Deputy Director reports to the Director (AUS-1).

e. Executive Office (AUS-10). This office is responsible for maintaining strategic messaging regarding FAA UAS integration activities and providing executive-level support services to the Director and Deputy Director. This office performs the following functions:

- 1) Coordinates and tracks responses to Congressional inquiries, general correspondence, and Reports to Congress.
- 2) Provides preparation support for Congressional Hearings and Questions for the Record.
- 3) Provides content and support for events, conferences, All Hands Meetings, and other messaging opportunities.
- 4) Provides executive-level support services to AUS-1 and AUS-2.
- 5) Acts as the primary liaison to the Office of the Chief Counsel (AGC), Office of Government and Industry Affairs (AGI), and the Office of Communications (AOC).
- 6) Coordinates and supports executive-level committees and partnerships.
- 7) Maintains and provides support for AUS SharePoint and Knowledge Sharing Network (KSN) sites.

- 1) Business and Planning Division (AT'S-100).** This division is divided into two branches: Business Administration (AT'S-110) and Planning and Performance (AT'S-120). The division is responsible for business planning and reporting, fiscal and human resource management, training, riskmaking prioritization, Quality Management System (QMS) management, program management and analysis, information management, and administrative management services within AT'S. This division performs the following functions:
- 1) **Business Administration Branch (AT'S-110).** This branch is responsible for the following functions:
 - i) In accordance with established FAA and AVS administrative policies and procedures, provides administrative management support to AT'S for personnel management, labor and employee relations, general office services, and logistical support.
 - ii) Coordinates responses and responds to whistleblower, hotline, Accountability Board and other investigations, complaints and inquiries.
 - iii) Develops and implements AT'S employee training programs.
 - iv) Develops and implements AT'S policies, programs, processes, and procedures governing administrative, information, rulemaking, and budget.
 - v) In accordance with established FAA and AVS administrative policies and procedures, provides administrative management support to AT'S for Freedom of Information Act control and general paperwork.
 - vi) Coordinates the development of and manages the AT'S annual budget including travel expenditures, services (including professional service contracts), and other expenditures.
 - vii) Prepares and submits one-time and recurring information reports, as required.
 - viii) Acts as liaison to the FAA Office of Information Technology (OIT).
- 2) Planning and Performance Branch (AT'S-120).** This branch is responsible for the following functions:
- 1) Strategic planning and the development and implementation of the AT'S Office Strategic Plan and the integration of Civil FAS in the NAS Roadmap.

- ii) Provides advice, counsel, and program support to the Director and the AUS management team on management systems, processes, procedures, principles, and methodologies.
- iii) Business planning and reporting; and program analysis, evaluation, success metrics, and quality assurance (QA) measures.
- iv) Ensures the appropriateness, applicability, currency, and periodic revision of AUS Standard Operating Procedures (SOPs), maintenance of the QMS, and records management in accordance with FAA Order 1350.14.
- v) Supports dashboards and Legislative Implementation Plan tracking.
- vi) Coordinates and responds to all Office of Inspector General (OIG) and General Accounting Office (GAO) inquiries and audits.

g. International Division (AUS-200). This division is responsible for the management and coordination of international activities for UAS within AVS and for coordination of UAS international activities with other FAA LOBs and SOs. The division provides leadership, strengthens existing partnerships, develops new relationships, ensures alignment of UAS international activities with U.S. and FAA international strategy, and collaborates with foreign civil aviation organizations to improve global aviation safety. This division performs the following functions:

- 1) Coordinates with all appropriate LOBs and SOs on FAA UAS international engagement strategy, international meetings, and responses to international information requests.
- 2) Serves as the primary point of contact (POC) for FAA UAS international activities and technical agreements.
- 3) Ensures UAS international standards, practices and procedures are consistent with FAA plans and criteria, and promotes international acceptance of U.S. UAS airman and aircraft certification standards.
- 4) Coordinates with the Office of International Affairs (API) on policy and operational issues affecting international UAS operations.
- 5) Serves as the AVS UAS POC for the Inter-Agency Group on International Aviation (IGIA) and coordinates U.S. positions and strategy.
- 6) Collects, organizes, analyzes, and provides data and information about international UAS activities to support cross-Agency decision-making.

h. **Research Division (AUS-300).** This division is responsible for strategic planning and direct support of continued UAS Research and Development (R&D). The division also provides input on requests for research required for advanced mitigation. This division performs the following functions:

- 1) Identifies R&D needs for the safe integration of UAS into the NAS; coordinates with all appropriate LOBs and SOs within the Agency to ensure needed UAS research activities are accomplished; and identifies areas of research within the UAS community where research opportunities may be leveraged.
- 2) Serves as the AVS focal point for development of Agency R&D programs related to UAS operations.
- 3) Participates on the AVS Research, Engineering, and Development (RE&D) Group representing AUS-1 in the execution of the AVS R&D process and the execution of AVS R&D program activities.
- 4) Organizes and leads the Technical Community Representative Group (TCRG) for UAS activities.
- 5) Oversees the execution of UAS research in the AVS R&D portfolio in conjunction with research execution organizations.
- 6) Coordinates research with key government and industry partners to support FAA strategic initiatives.
- 7) Participates in national and international working groups as needed to understand research and development needs to progress key policy and technical needs for UAS integration.
- 8) Identifies knowledge gaps, proposes research, and sponsors approved research covering all aspects of UAS integration.

i. **UAS Safety and Integration Division (AUS-400).** This division is divided into three branches, Program and Data Management (AUS-410), Technical Support (AUS-420), and Safety and Operations (AUS-430). The division performs the following functions:

- 1) **Program and Data Management Branch (AUS-410).** This branch is responsible for project and data management for all UAS programs and activities managed or coordinated by AUS. This branch performs the following functions:
 - i) Manages and coordinates all UAS-related projects, in conjunction with all appropriate offices, requiring significant resources of varied disciplinary backgrounds, and having high potential impact to national policy.
 - ii) Coordinates with AIT and other LOBs and SOs that maintain data used by the AUS organization.
 - iii) Collects and examines all operational UAS data and conducts appropriate analyses to identify important trends and new operational risks; prepares quarterly reports on all UAS data collected; and provides recommendations for follow-up actions and changes to existing operational mitigations based upon UAS data analysis and trends. Collaborates with the Safety Management and Research Planning Division, AVP-300, as appropriate.
 - iv) In collaboration with the appropriate policy organizations, coordinates the development of the UAS accident/incident database/tracking system to ensure accident/incident reports are properly recorded and monitored until concluded, and provides recommendations for changes to mitigations and dissemination of information.
 - v) Maintains databases for UAS information as needed.

- 2) **Technical Support Branch (AUS-420).** This branch is responsible for supporting standards and policy development related to UAS, and providing engineering resources to support UAS projects. This branch is responsible for the following functions:
 - i) Provides or coordinates the participation of UAS subject matter experts (SMEs) in standards and policy development activities with internal and external stakeholders.
 - ii) Provides or coordinates SMEs to participate in national and international standards working groups.
 - iii) Collaborates with all FAA LOBs and SOs on UAS policy, standards, and regulations impacting, and impacted by, implementation of NextGen technology.
 - iv) Provides engineering support and analysis for current and future UAS projects.

- v) Participates in the development and review of requirements, advisory circulars (AC's), technical standard orders (TSOs), and other informational guidance to facilitate the integration of UAS into the NAS.
 - vi) Provides guidance and expertise regarding UAS spectrum management and cybersecurity.
 - vii) Provides systems engineering support for strategic planning projects.
 - viii) Coordinates with all appropriate LOBs and SOs on FAA UAS technical matters to ensure consistent application of standards and requirements, and alignment with overall FAA plans.
- 3) **Safety and Operations Branch (AUS-430).** This branch is responsible for coordinating operational aspects of safe and timely integration of UAS within the National Airspace System (NAS). The branch performs the following functions:
- i) Supports the development of regulations, policies, advisory circulars (AC's), standardized procedures and other documents to enable integration of UAS in the NAS; supports compliance with all general, special, and safety provisions of UAS COAs and airworthiness certificates; supports efforts to ensure that UAS COA safety mitigations are consistent with current policies and procedures.
 - ii) Supports the development of policies, standardized procedures and technical guidance for Aviation Safety Inspectors (ASIs) at Headquarters, Regional, and Flight Standards District Offices (FSDOs); supports the development of policy and guidance to ensure that ASIs receive initial and continuation training for integration of UAS in the NAS.
 - iii) Develops and implements the FAA's Safety Management System (SMS) for AUS, and directly supports Safety Risk Management (SRM) panels.
 - iv) Assists in the development of guidance and orders for ASIs including surveillance, investigations, and enforcement; assists with the development of Job Task Items (JTIs) for UAS inspections; anticipates and suggests modifications to the National Work Program Guidelines.
 - v) In collaboration with the appropriate policy organizations, reviews accident, incident, and enforcement investigations involving UAS flight operations and recommends appropriate corrective action.

- vi) Participates with the Office of Primary Responsibility (OPR) in the development of air traffic and airspace integration policy, procedures, and guidance for UAS operations in the NAS.
- vii) Supports ATO, AFS, and the Aircraft Certification Service (AIR) to ensure UAS COA/airworthiness reporting requirements are tailored so the proponent provides data that will support AUS policy and guidance decision-making.
- viii) Updates and maintains the AUS Emergency Response Checklist; disseminates and coordinates information related to all UAS accidents/incidents to the appropriate FAA offices; participates in all investigation activities related to UAS flight operations in the NAS.
- ix) Recommends operational guidance and policy to UAS COA proponents, FAA Regions and FSDOs, and other elements of the Agency on all aspects of UAS operations with an emphasis on safety risk management.

6. **Organization Charts.** The AVS organizational chart is attached as Appendix A. The AUS organizational chart is attached as Appendix B.

7. **Distribution.** This notice is distributed to the division level in the Washington Headquarters, Regions, and Centers with distribution to each field office and facility.



Michael P. Huerta
Administrator

Appendix A. AVS Organizational Chart

Appendix B. AUS Organizational Chart

Appendix B: AVS Research and Development Strategic Guidance for FY2019



Federal Aviation Administration

Memorandum

Date: **MAY 19 2016**

To: AVS Services and Offices

From: Peggy Gilligan, Associate Administrator for Aviation Safety

Subject: AVS Strategic Guidance for Development of the FY 2019 Research & Development (R&D) Safety Requirements Portfolio

Thank you for your support in developing the FY 2018 Aviation Safety (AVS) research portfolio. Balancing competing safety requirements against limited resources is a huge challenge. That is why it is extremely important that research we do in AVS leads to measurable safety enhancements that truly benefit the flying public. In fact, clear identification of the desired outcome is a key value in the AVS R&D Prioritization Process. I am excited about the path we are on, the continuous improvement we are making in our research program, the quality of the requirements, and our use of risk-based prioritization and decision-making.

Looking forward to 2019, we created the attached AVS Strategic Guidance (SG) for development of the FY 2019 R&D Portfolio. As you know, AVS has adopted Safety Management System processes and Risk-Based Decision-Making. This SG supports these approaches with the inclusion of aviation safety hazard and risk data, emerging risks, and guidance on the consideration of Significant Safety Issues in the development of safety outcomes, implementation plans, and research needs. Sponsors should supplement the SG data with the additional data and analysis needed to fully identify and assess desired sponsor outcomes.

Although the SG emphasizes areas that are important to the AVS mission in FY 2019 and beyond, it is not intended to exclude or restrict proposed research requirements. Rather, this guidance is intended to emphasize areas of aviation safety risk that AVS Services and Offices (S/O) and their Technical Community Representative Groups (TCRGs) should consider when developing safety outcomes, implementation plans, and research requirement proposals. The SG is not intended to be a checklist used to evaluate the proposed requirements either—requirements are evaluated against the criteria in the AVS Prioritization Process. Each S/O may decide to provide additional direction to their divisions and directorates who can then provide the specifics to their line organizations and TCRGs.

Each S/O should review existing research plans, regulations, standards and policy issues, and cross-coordination of S/O needs. This will allow us to develop the best aviation safety research

portfolio possible that balances short and long term safety needs against our ongoing resource constraints. Once we get funding to conduct a project, we have to see the research all the way through implementation and measure it to make sure it is having the intended impact on safety.

By continuing to communicate, collaborate, work together, and improve the program we have in place, our research efforts will make aviation safer tomorrow than it is today. Thank you for your help.

Attachment

Cc: P. Martinez, M.S. Orr, D. Kramar (AVP-300)
D. Brock (AFS-150)
M. Yeh (AIR-134)
F. Wondolowski (AOV-320)
E. Forster (AAM-600)
J. Simmons (AFS-088)

AVS Research & Development Strategic Guidance

Introduction

This document provides guidance for the development of the FY19 Aviation Safety Organization (AVS) Research & Development (R&D) portfolio. This Strategic Guidance (SG) identifies some hazards, risks, and safety issues based upon samples of data that may drive AVS research needs. While this data covers a variety of operations, it is only a subset of the extensive aviation safety data that impact the Federal Aviation Administration (FAA), and specifically AVS responsibilities. This SG provides notional direction only. It is the responsibility of each AVS Service or Office (S/O) to determine research needs within their areas of responsibility that support the AVS mission.

All Technical Community Representative Groups (TCRGs) Leads and Office of Primary Interest (OPI) Representatives should develop and/or update their research project plans. Research plans provide an organized long-range focus on critical research requirements, thus enabling AVS to identify and coordinate long-range resource needs, increasing the likelihood that necessary resources will be available.

Communication is critical to the successful development of the annual AVS R&D portfolio. Direct any questions and comments about the SG or other AVS research-related issues to the OPI representative, the AVS S/O Research, Engineering, and Development (RED) Group Member, and the AVS R&D Manager.

Aviation Safety Hazards and Risks for AVS-Wide Consideration

AVS is responsible for responding to today's hazards and risks, as well as preparing for potential risks associated with changes related to the Next Generation Air Transportation System (NextGen), current FAA Strategic Initiatives, and other foreseeable (and unknown) economic and industry trends. Ensuring that regulations and guidance materials maintain relevancy will require the continued implementation of a comprehensive approach, with reactive, proactive, and predictive components integrated into an agency-wide Safety Management System (SMS) framework. The AVS R&D Program is one of the critical tools supporting development of effective means for continued safety improvement.

The FAA's Office of Accident Investigation and Prevention analyzed data sources to identify some high priority hazards and risks facing the National Airspace System (NAS). Consideration of these hazards and risks during research requirement development will stimulate multi-disciplinary and coordinated efforts across AVS offices and TCRGs, and the development of research requirements that address these hazards and risks. Thus, AVS will be in a position to meet safety goals and responsibilities spanning the lifecycle of certification and continued operational safety.

Risks to Aviation Safety in the Current NAS

Aviation safety data provides a historical basis from which to determine the most significant high-priority risks to safety in the current NAS. Mitigating these risks will have the most direct and predictable effect on the reduction of future accidents, incidents and associated human injuries and fatalities.

In accordance with the mission of AVS, research requirement proposals should contribute to the development and implementation of FAA guidance materials, processes, regulations, policy, and/or standards that serve to reduce high-priority risks. These research proposals should identify the aviation safety data they are based upon.

When developing research requirement proposals, AVS S/O Sponsors should consider accident statistics within various aviation sectors. For example, the percentage of total accidents attributed to the following events is elevated for Title 14, Code of Federal Regulations (14 CFR) Part 121 Operations, as shown in Figure 1 (See Attachment (1) for acronym key):

- Loss of Control – In Flight
- Structural Component or Aircraft System Failures/Malfunctions (Non-powerplant)
- Runway Excursions – Landing

In comparison, as shown in Figure 2, the percentage of total accidents for General Aviation is elevated for the following events:

- Loss of Control – In Flight
- Controlled Flight Into or Toward Terrain
- Structural Component or Aircraft System Failures/Malfunctions (Powerplant)

Finally, the percentage of total rotorcraft accidents is elevated for the following events as shown in two data sets in Figure 3:

- Loss of Control
- Autorotation
- System Component Failure

Carefully consider trends within aviation sectors when developing research requirement proposals. Each AVS S/O and TCRG should carefully consider these differences and trends and all other related data and activities that may influence research needs and priorities.

Emerging Risks to Aviation Safety

Historical accident data highlights hazards capable of producing severe and negative outcomes, though it is not comprehensive for forecasting future significant risks to the aviation community. Moving beyond this reactive historical data to include proactive and predictive approaches involves identifying current or emerging hazards with a high likelihood or potential to result in significant safety risks. Proactive and predictive

approaches enable AVS to move forward in the research cycle to prevent accidents and manage safety with the changing composition of hazards.

Currently, the Aviation Safety Information Analysis and Sharing (ASIAS) framework is useful for identifying trends and emerging risks. This source has previously identified risks likely to become more severe in the coming years, such as:

- Loss of Separation
 - Mid-Air Collisions
 - RNAV Arrival and Departure Procedures
- Breakdown in Pilot-Controller Communication
- Airplane State Awareness

The results of systems-level modeling of safety outcomes to predict and forecast risk are being developed and validated. This modeling incorporates planned changes associated with NextGen, as well as unplanned changes associated with market trends and fluctuations. In the interim, by reviewing government and industry reports that rely on historical data, statistical trends, and the input of subject matter experts, a short set of near-term, high-priority safety issues emerge that transcend specific implementation plans, technologies and operational frameworks (as listed below). Each AVS S/O should refer to this set of safety issues for help in identifying relevant domain-specific future hazards and risks:¹

- Aircraft Mixed Fleet Equipage
- Assurance of Functional Integrity for Critical Systems
- Certification Methods for Complex Systems (for example, software)
- Changing Roles for Air Traffic and Flight Deck Personnel
- Human-Automation Interaction
- Human Performance Vulnerabilities
- Information and Systems Security
- Interoperability and System Incompatibilities
- System Safety Assessment Methods and Tools
- New types of user technologies, such as unmanned aircraft systems (UAS) and commercial space vehicles

Each safety issue encompasses multiple hazards and potential risks. For example, research in the area of System Safety Assessment Methods and Tools that addresses increased component and system complexity may also include methods to identify common-cause failures and the introduction of new failure modes. Multiple approaches across AVS S/Os and TCRGs that will mitigate anticipated risks are encouraged for developing responses to these issues.

In fall 2014 the Research, Engineering, and Development Advisory Committee's (REDAC) Subcommittee on Aircraft Safety (SAS) developed a set of Emerging Issues and Future Opportunities to provide input on strategic aspects of the AVS research portfolio. Each year the REDAC SAS carefully reviews proposed AVS research

¹ This list is not comprehensive; Issues are organized in alphabetical order – placement does not suggest priority.

portfolios, provides research recommendations to the FAA, and determines whether the list of Emerging Issues and Future Opportunities they identified should be changed or adjusted. The SAS has identified this current set of Emerging Issues and Future Opportunities that AVS S/Os may consider as they determine their needs for safety-related research and anticipate future research needs:

- Real-Time System-Wide Safety Assurance
- Dependability of Increasingly Complex Systems
- Certification of Advanced Materials and Structural Technologies
- High-Energy Density Storage, Management, and Use
- Commercial Space Integration into the NAS
- General Aviation's Role in Safety Systems Development
- Effects of Breakthrough Medical Technologies on FAA Medical Certification Standards
- Identification and Segregation of Strategic R&D Needs

Significant Safety Issues

Under the Administrator's Risk-Based Decision Making Strategic Initiative², the FAA is currently developing methodologies for identifying, prioritizing, and tracking Significant Safety Issues (SSIs) that cross FAA lines of business (LOB). SSIs may indicate existing or emerging safety risks needing mitigation to an acceptable level, and they can support decision-making processes in implementing system improvements. In support of this effort, AVS is maturing an internal SSI identification process. Issues and associated mitigations that only affect AVS remain on the internal SSI list, while cross-LOB issues are raised to the FAA level.

The prioritized AVS SSI list includes issues derived from AVS safety related analyses and reports. Each AVS S/O has input during the process, and each AVS S/O sends at least one subject matter expert to participate in safety data evaluation and prioritization. AVS S/Os are encouraged to consider SSIs and proposed controls and mitigation strategies in determining their research needs, and should identify these SSIs in their research requirement proposals.

Key Technology Areas

There are key technology areas where the FAA has provided research leadership. There are certain areas where FAA is performing research that cannot be duplicated anywhere else in the world. FAA must maintain this critical research in areas that make up the backbone of its long term FAA R&D program. In such cases, FAA has a strategic need to maintain in-house capability and competency to perform research.

² FAA Strategic Initiatives: Risk-Based Decision Making:
https://my.faa.gov/content/my.faa/en/org_staff/offices_AOAI/Strategic_Initiatives_Group/SGRisk.html

1987-2011 Part 121 Hull Loss and Fatal Accidents

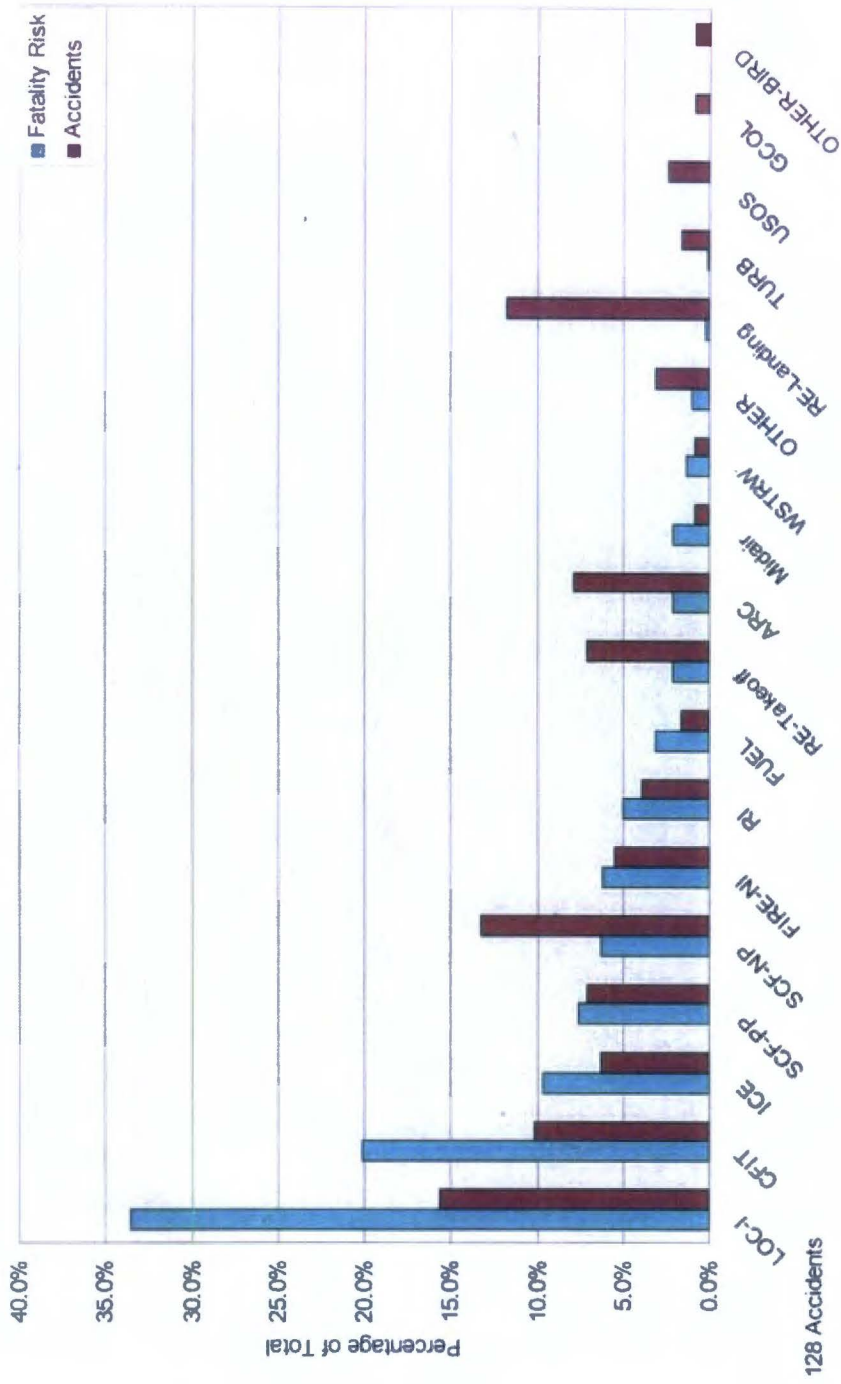
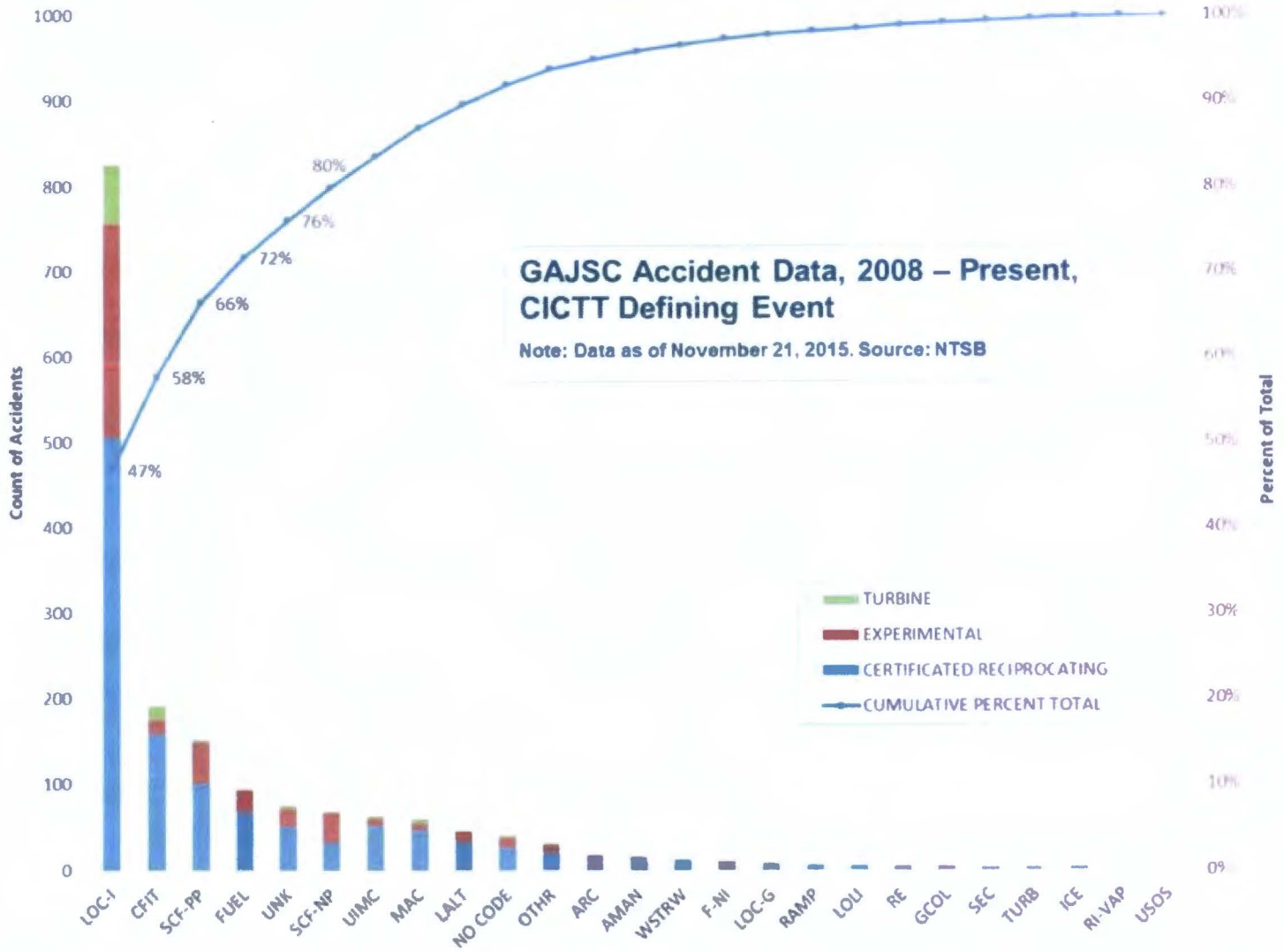


Figure 1

Source: Commercial Aviation Safety Team (CAST) – Domestic U.S. Part 121 Operations
 Outcomes: Categorized according to Common CAST/ICAO Common Taxonomy Team (CICCT) – Occurrences Taxonomy
 Fatality Risk: Sum of equivalent full plane loads perished per event

General Aviation Joint Steering Committee (GAJSC) Data
Common CAST/CAO Common Taxonomy Team (CICCT) Defining Event

Figure 2



Supplemental Research Requirement Instructions

- a. **You must complete all REQUIRED fields on the requirements submittal form on the AVS RE&D Management System KSN site for each requirement.** The AVS RED Group will not evaluate requirements with incomplete forms. If the sponsor feels there are circumstances where the form cannot be completed, the sponsor shall contact the OPI representative and/or RED Group member for guidance and assistance **before your office's deadline or before the AVS research proposal submission deadline of September 23, 2016.**
- b. **Sponsoring Office Manager's Approval:** Per Section 4.5 of the Process, the Sponsoring Office Manager, as delegated by the AVS S/O, must endorse and date each requirement. This approval confirms the requirement has the review and approval of the sponsoring Directorate or Division manager.

Sponsoring Office Management Approval indicates the Sponsor Point of Contact (POC) and the Sponsoring Office's Manager listed on the requirement are fully accountable for the requirement throughout the requirement life-cycle.

The Sponsor POC field should identify only ONE sponsor and the Sponsoring Office Management Approval field should identify ONE directorate or division manager in the direct management chain for the individual identified as the Sponsor POC. Multiple sponsorships and Sponsoring Office Management Approvals may create ambiguity regarding ownership and accountability for the requirement and outcome.

If multiple AVS S/O's need research in a similar area, each S/O should submit its own requirement (identifying the linkage between the AVS requirements), specifying the unique sponsor outcome for each requirement. The Sponsor POC and Sponsoring Office's Manager identified in each requirement MUST have authority over the respective implementation plans identified in each requirement (i.e., AIR personnel and organizations should not be identified as sponsors for topics that specify an AFS outcome and implementation plan). Due to the similarity, each requirement should specify a link to the other in the Linked AVS Requirements field provided on the AVS RE&D Research Requirement Input Form.

When an S/O has an interest in a requirement of another S/O, but no responsibility for an outcome or implementation, the sponsor of the requirement should specify the interested organizations in the Other Related Office(s) field in the AVS RE&D Research Requirement Input Form.

In the unlikely event there is a requirement that cannot conform to these instructions: the sponsors should contact the associated AVS RED Group Members and the AVS R&D Manager for consultation and guidance.

- c. **Linked AVS Requirements:** As applicable, requirements with linkages to other AVS RE&D requirements, shall list the specific linking requirement control account numbers and titles, along with a short description of the linking relationship and how the requirements are being coordinated. For assistance with the linkage field, the

Occurrence Category	JHIMDAT (CY09-11): 415 Accidents	JHSAT (CY00-01,06): 523 Accidents
LOC – Loss of Control	47.5% (197)	41.5% (217)
AUTO – Autorotation	32.8% (136)	31.7% (166)
ARC – Abnormal Runway Contact	24.6% (102)	7.6% (40)
SCF – System Component Failure	21.4% (89)	27.5% (144)
STRIKE	19.8% (82)	16.4% (86)
FUEL	8.2% (34)	7.6% (40)
VIS – Visibility	8.0% (33)	10.7% (56)
FIRE	7.0% (29)	6.1% (32)
CFIT – Controlled Flight into Terrain	6.7% (28)	3.1% (16)

Figure 3

Occurrence Category Comparison

Data from:

Comparative Report, Volume 1

U.S. Joint Helicopter Implementation Measurement Data Analysis Team (JHIMDAT) Data to U.S. Joint Helicopter Safety Analysis Team (JHSAT) Data

To The United States Helicopter Safety Team, March 2014

sponsor should contact the OPI representative. The linked requirements should cross reference each other.

- d. **Research Connection to Strategic Guidance:** During the April 28, 2014 AVSMT, AVS-1 asked that the research requirements show connection to the Strategic Guidance. To meet this request, a "Strategic Guidance Connection" field has been added to the requirement template. The requirement write-up must indicate whether there is a connection to the SG, and if so must clearly identify the connection. The requirement write-up should refer to data provided in this document, and/or reference additional data sources. Completing these fields will meet the AVS-1 request and will not affect requirement ranking, as these fields are not explicitly part of the ranking criteria. However, you should use **data on safety hazards and mitigations from the sources referenced in these fields in the justifications for the evidence and impact for each of the ranking criteria.** This strengthens the justifications used to determine the ranking. As stated in part (a) above, all required fields must be completed for evaluation by the AVS RED Group.
- e. **Use plain language.** Please keep in mind that the AVS RED Group reviewing the requirement does not have intimate knowledge of the activity. Please reference the link below for additional guidance on the use of plain language.

https://nrv.faa.gov/tools_resources/branding_writing/plain_language.html

AVS R&D Prioritization Process Supplement

- a. **Development of Cost Estimates:** In accordance with Section 5.1 of the 2013 Aviation Safety R&D Prioritization Process, the AVS RED Group will distribute an abbreviated list of prioritized requirements that have a reasonable likelihood of funding within the Aircraft Safety budget target. Performing organizations will submit cost estimates for these requirements **not later than December 2, 2016** in accordance with Section 5.2 of the Process. The performing organization responsible for executing the research will develop the cost estimate(s) in coordination with their sponsor(s). Only tasks outlined in the requirement write-up should be programmed for funding. In accordance with Section 5.2 of the Process, cost estimates will include fiscal year costs for the duration of the research project. A template for developing FY19 cost estimates is available on the [AVS R&D Management System KSN](#).³ Each AVS RED Group member must ensure that the tasking identified in the cost estimate aligns with the sponsors' research objectives within the requirement. Incomplete or incorrect cost estimates affect programming decisions.

- b. **Unbudgeted Research Requirements:** AVS sponsors are reminded that when submitting an unbudgeted research requirement per Section 8 of the AVS R&D Prioritization Process, they may also work with their respective performers as necessary to submit Requirement Execution Plans (REPs) and Provider Research Execution Plans (PREPs) *in parallel* with the submission of the requirement write-up. Furthermore, you must submit an unbudgeted research within the appropriate fiscal year's research portfolio so that it aligns with the fiscal year funding requested. For example, if you request FY15 carryover funding for a particular unbudgeted research requirement, then you must submit that requirement to the FY15 research portfolio.

- c. **AVS RED Group Member Concurrence:** The AVS R&D portfolio requires concurrence by each AVS RED Group Member before it receives final approval by AVS-1. Furthermore, each time there are major changes to an approved portfolio, for example, in the events of Continuing Resolution or Sequestration, AVS RED Group Member concurrence is needed in order to formally accept portfolio changes. A concurrence sheet will be used to document AVS RED Group Member concurrence, as well as to state the impact of the proposed portfolio changes. When signing this form, each AVS RED Group Member is representing the position of their respective S/O director, and may provide comments (including proposed alternatives or recommendations) as a condition of their concurrence; however, additional meetings or discussions among RED Group Members may be required in order to resolve comments. A sample concurrence sheet signature box is below (Figure 4), capturing concurrence and comments. The total document may also provide impact statements.

³ Link to R&D Cost Estimate

<https://avssp.faa.gov/avs/aviationsafetyresearch/AVS%20RD%20Process/Forms/AllItems.aspx>

proposed alternatives, as well as a deadline when concurrence is due to the AVS R&D Manager.

NAME/ORG	CONCUR	CONCUR W/ COMMENTS	NON- CONCUR	NON- CONCUR W/ COMMENTS	INITIALS
Name 1/AVS					
Name 2/AAM					
Name 3/AFS					
Name 4/AIR					
Name 5/AOV					
Name 6/AVP					
Name 7/AUS					
Comments:					

Figure 4

Sample signature box from AVS RED Group Member Concurrence Sheet

- d. **Development of UAS Research Proposals:** In accordance with Section 4.3 of the 2013 Aviation Safety R&D Prioritization Process and in alignment with the mission of the UAS Integration Office, from this time forward all research proposals for Aviation Safety RE&D funding related to the safe integration of UAS in the NAS must be made through the UAS TCRG. This includes all new research proposals for FY19 and beyond as well as unbudgeted requests from now forward. This will ensure proper coordination between all of the UAS subject matter experts, in keeping with the function of the TCRG.

Attachment (1)

ACRONYMS and KEY TERMS:

ARC: Any landing or takeoff involving abnormal runway or landing surface contact.

CFIT: Controlled Flight Into or Toward Terrain. In-flight collision or near collision with terrain, water, or obstacle without indication of loss of control.

Fire-NI: Fire/Smoke (Non-Impact). Fire or smoke in or on the aircraft, in flight or on the ground, which is not the result of impact.

Fuel: Fuel related. One or more powerplants experienced reduced or no power output due to fuel exhaustion, fuel starvation/mismanagement, fuel contamination/wrong fuel, or carburetor and/or induction icing.

GCOL: Ground Collision. Collision while taxiing to or from a runway in use.

ICE: Icing. Accumulation of snow, ice, freezing rain, or frost on aircraft surfaces that adversely affects aircraft control or performance.

LALT: Low Altitude Operations.

LOC-G: Loss of Control – Ground. Loss of aircraft control while the aircraft is on the ground.

LOC-I: Loss of Control – In Flight. Loss of aircraft control while or deviation from intended flight-path in-flight.

MAC: Midair/Near Midair Collision. Airprox, ACAS alerts, loss of separation, as well as near collisions or collisions between aircraft in flight.

Other: Any occurrence not covered under another category.

Other-Bird: Occurrences involving collisions / near collisions with bird(s) / wildlife

Ramp: Ground Handling. Occurrences during (or as a result of) ground handling operations.

RE-Landing: Runway Excursion Landing. A veer off or overrun off the runway surface.

RE-Takeoff: Runway Excursion Takeoff. A veer off or overrun off the runway surface.

RI: Runway Incursion: – vehicle, aircraft or person. Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft.

RNAV: Area Navigation. A method of navigation that permits aircraft operation on any desired flight path within the coverage of navigation aids

SCF-NP: System/Component Failure or Malfunction (Non-Powerplant). Failure or malfunction of an aircraft system or component – other than the powerplant.

SCF-PP: System/Component Failure or Malfunction (Powerplant). Failure or malfunction of an aircraft system or component – related to the powerplant.

TURB: Turbulence Encounter. In-flight turbulence encounter.

UNK: Unknown or Undetermined. Insufficient information exists to categorize the occurrence.

USOS: Undershoot/Overshoot. A touchdown off the runway/helipad/helideck surface.

WSTRW: Windshear or Thunderstorm. Flight into windshear or thunderstorm.

Appendix C: Acronyms

ABP	Office of Budget and Programs
ACRP	Airport Cooperative Research Program
AFN	Office of Finance and Management
AIP	Airport Improvement Program
ANG	NextGen
API	Office of International Affairs
ARP	Airports
ASSURE	Alliance for System Safety of UAS through Research Excellence
AUS	UAS Integration Office
AVS	Office of Aviation Safety
BLI	Budget Line Item
COE	Center of Excellence
DAA	Detect and Avoid
EA	Enterprise Architecture
F&E	Facilities and Equipment
FAA	Federal Aviation Administration
LOB	Line of Business
MOPS	Minimum Operational Performance Standards
NARP	National Aviation Research Plan
NAS	National Airspace System
NASA	National Aeronautics and Space Administration
NSIP	NextGen Segment Implementation Plan
OMB	Office of Management and Budget
OST	Office of the Secretary of Transportation
R&D	Research and Development
RE&D	Research, Engineering, and Development
RED	Research, Engineering, and Development
REDAC	Research, Engineering, and Development Advisory Committee
RTT	Research Transition Team
S/O	Service or Office
SAA	Sense and Avoid
SARP	Science and Research Panel
SAS	Subcommittee on Aircraft Safety
SC-228	Special Committee 228
SLA	Service Level Agreement
TCRG	Technical Community Representative Group
UAS	Unmanned Aircraft Systems
UTM	Unmanned Aircraft Systems Traffic Management
