Airport Safety Technology R&D

REDAC Recommendation Update

Presented to: Subcommittee on Airports

By: Jim Patterson

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Federal Aviation Administration

REDAC Recommendations

ID #	Recommendation	Status	Open/Closed
Fall_2015_03	Concept of Operations for LCGSS	Implemented	Closed 8/16/16
Fall_2015_04	Overload Criteria for Flexible Pavements	Implemented	Closed 8/16/16
Spring 2016_1	RPA	Implemented	Closed 3/15/17
Spring 2016_2	New Facilities	Implemented	Closed 3/15/17
Spring 2016_3	FY18 Budget	Implemented	Closed 3/15/17
Spring 2016_4	Focus on Airport Planning and Environment	Implemented	Closed 3/15/17
Spring 2016_5	UAS	Implemented	Closed 3/15/17
Spring 2016_6	Airport Safety Database	Implemented	Closed 3/15/17
Fall 2016 1	National Airport Pavement Materials Research Center	Implemented	Closed 3/15/17
Fall 2016 2	Asphalt Concrete Pavement Heat Exposure	Implemented	Closed 8/16/17
Fall 2016 3	Runway Surface Safety Technology	Implemented	Closed 3/15/17
Spring 2017 1	Cross-cutting Strategic Research	Reviewed 8/15/17	OPEN

REDAC Recommendations

ID #	Recommendation	Status	Open/Closed
Spring 2017 2	Airports Research Prioritizations	Reviewed 8/15/17	OPEN
Spring 2017 3	Research Program Completion Projections	Reviewed 8/15/17	OPEN
Spring 2017 4	Research Completion Priorities	Reviewed 8/15/17	OPEN
Fall 2017 1	Runway Braking Friction	Reviewed 3/20/18	OPEN
Fall 2017 2	Heated Pavement	Reviewed 3/20/18	OPEN
Fall 2017 3	LED Lighting Research	Reviewed 3/20/18	OPEN
Fall 2017 4	Improving Awareness of other REDAC Research	Reviewed 3/20/18	OPEN
Spring 2018 1	Commercial Spaceport Standards	DRAFT	OPEN
Spring 2018 2	Future Research and Facilities Prioritization	DRAFT	OPEN
Spring 2018 3	Collaborative Aircraft Braking Research	DRAFT	OPEN

REDAC Recommendations

ID #	Recommendation	Status	Open/Closed
Spring 2018 4	Trapezoidal Runway Grooving	DRAFT	OPEN
Spring 2018 5	National Airport Pavement Testing Facility	DRAFT	OPEN
Fall 2018 1	Commercial Airspace Aviation Rulemaking	DRAFT	OPEN
Fall 2018 2	Cybersecurity R&D Plan	DRAFT	OPEN
Fall 2018 3	PFAS Part 1 (Foam Proportioning Systems)	DRAFT	OPEN
Fall 2018 4	PFAS Part 2 (Gap Analysis)	DRAFT	OPEN
Fall 2018 5	DOT/FAA Strategic Research	DRAFT	OPEN
Fall 2018 6	Strategic Program Focus Part 1 (Agenda)	DRAFT	OPEN
Fall 2018 7	Strategic Program Focus Part 2 (Web/Teleconference Access)	DRAFT	OPEN

REDAC Recommendations

Spring 2017 – Reviewed 8/16/17 – Tentatively Approved

Finding 1 – Cross-cutting Strategic Research

The Subcommittee supports the FAA's efforts to update its research strategy, goals, objectives via the NARP, particularly with respect examining how the FAA's various research programs can more effectively address research that cuts across multiple research areas (e.g., air traffic system operations, airports, safety, and environment). Such a cross-cutting approach to research has proven to be successful in the area of airport noise research involving both the Airport Technology Research Program and Environmental Research Program.

Recommendation: The Subcommittee recommends that the FAA seek additional opportunities to utilize cross-cutting approaches to research and development that draw on the skills and expertise from multiple research programs. In addition to aircraft noise, research areas that are ripe for this approach are (1) cyber-security, (2) unmanned aircraft systems (UAS), (3) time based flow management (especially the surface elements of TBFM), (4) management of operations during irregular operations such as airport construction and adverse weather conditions , and (5) aviation safety management.

FAA Response DRAFT: The FAA concurs with the Committee's finding and is undertaking the following actions to address its recommendation(s): The FAA's Airport Technology Research Branch (ATR) will continue to seek opportunities to leverage other research programs, and when needed, will partner up with others (government agencies, trade associations, private industry, etc.) to enhance the ATR research portfolio. For instance, unmanned aircraft systems (UAS) research needs are constantly evolving, and the ATR branch is currently fully engaged with others at FAA, airports and industry to define airports-related UAS research and is planning to execute its research as part of a larger government-wide UAS research portfolio.

REDAC Recommendations

Spring 2017 – Reviewed 8/16/17 – Tentatively Approved

Finding 2 – Airports Research Prioritizations

The Subcommittee placed a high priority on research into new categories of aeronautical vehicles--UAS and commercial space vehicles specifically--and their potential impacts on airport safety, operations, and infrastructure. Other high priority research areas are: (1) pilot perception of light emitting diode (LED)-based airfield lighting systems (RPA S5), (2) aircraft rescue and firefighting agents (RPA S3), (3) runway incursion prevention technologies (RPA S1), and (4) noise standard development/refinement based on the findings of ongoing noise annoyance data collection (RPAs N2-N5).

Recommendation: The Subcommittee recommends that the FAA Office of Airports place a high priority on research associated with the research areas that include (1) pilot perception of light emitting diode (LED)-based airfield lighting systems (RPA S5), (2) aircraft rescue and firefighting agents (RPA S3), (3) runway incursion prevention technologies (RPA S1), and (4) noise standard development/refinement based on the findings of ongoing noise annoyance data collection (RPAs N2-N5), as well as, UAS and Commercial Space.

FAA Response DRAFT: The FAA concurs with the Committee's finding and is undertaking the following actions to address its recommendation(s): The FAA's Airport Technology Research Branch (ATR) in concurrence with the FAA's Office of Airports is placing high priority on research areas identified in Recommendation #2.

REDAC Recommendations

Spring 2017 – Reviewed 8/16/17 – Tentatively Approved

Finding 3 – Research Programs Completion Projections

Although it understands that the timelines for research projects are inherently uncertain, the Subcommittee would like to have a better understanding of when research projects are expected to conclude and get periodic updates regarding their schedule for completion as the projects progress.

Recommendation: The Subcommittee recommends that the FAA provide information regarding the estimated schedules for completing new research projects and provide schedule updates regarding ongoing research projects in its briefings to the Subcommittee.

FAA Response DRAFT: The FAA concurs with the Committee's finding and is undertaking the following actions to address its recommendation(s): The FAA's Airport Technology Research Branch Research Program Area (RPA) managers will provide estimated schedules with planned starts and projected of durations of major projects in their Research Program Areas.

REDAC Recommendations

Spring 2017 – Reviewed 8/16/17 – Tentatively Approved

Finding 4 – Research Completion Priorities

The Subcommittee finds that priority should be given to research projects that are close to completion (i.e., issuance of final research findings and/or conclusions), particularly those that have promising practical application.

Recommendation: The Subcommittee recommends that the FAA prioritize research projects that are close to completion such as the regarding trapezoidal grooving project.

FAA Response DRAFT: The FAA concurs with the Committee's finding and is undertaking the following actions to address its recommendation(s): The FAA's Airport Technology Research Branch (ATR) in concurrence with the FAA's Office of Airports is constantly reviewing the list of research projects that are ready to be undertaken and for which results can be obtained in a timely manner, and plans to fund these as soon as budgets allow to proceed. For example, the final FY-17 ATR budget was recently received and ATR is proceeding with funding the trapezoidal grooving project in the summer of 2017.

REDAC Recommendations

Fall 2017 – Reviewed 3/20/18 – Tentatively Approved

Finding 1 – Runway Braking Friction

Finding #1: Runway Braking Friction - The Subcommittee was pleased by FAA's reassessment of the Runway Braking Friction project as well as convening a working group of subject matter experts from with a broad range of technical expertise - including aerodynamics, aircraft systems, braking systems, and human factors- to re-scope braking research plans across FAA research programs. While the Subcommittee understands that these reassessment and expert review efforts are not complete, we would like to have a general idea of how the FAA believes needed braking research should proceed.

Recommendation: The Subcommittee encourages the FAA to complete its reassessment of its runway braking friction research projects as soon as possible, with a focus on the objective of providing a reliable, objective method of aircraft runway friction assessment that accurately accounts for the effects of runway contaminants impacts on aircraft performance. Following this reassessment, the Subcommittee would like to receive a revised runway braking friction research plan that addresses issues identified by the aforementioned runway braking friction working group. We also recommend that the runway braking working group report back its recommendations at the next Subcommittee meeting, and possibly to the full REDAC membership, time and resource permitting.

FAA Response DRAFT: The FAA concurs with the Committee's finding and is undertaking the following actions to address its recommendation(s): The FAA's Airport Technology Research Branch (ATR) will continue to lead an Aircraft Braking Friction Expert Technical Working Group. The Technical Group was formed in 2017 and has already performed a general assessment of research conducted in the Aircraft Braking Friction area by FAA and industry. The next task for the technical working group will be to develop a FAA long-term aircraft braking friction research program plan. The draft plan will be presented during the next meetings of the REDAC, both and the subcommittee- and full committee- levels.

REDAC Recommendations

Fall 2017 – Reviewed 3/20/18 – Tentatively Approved

Finding 2 – Heated Pavement

The Subcommittee was pleased to learn that use of heated pavements to mitigate frozen contaminants in airfield pavements may be possible at lower costs than originally thought. Given the increased likelihood the economic feasibility of heated pavements, the Subcommittee believes that some consideration should be given to the potential safety and operational issues associated with such pavements, particularly those that use electrical means to heat the pavements.

Recommendation: The Subcommittee recommends that the FAA consider safety risks associated with electrically heated pavements as well as the potential for electromagnetic interference associated with such systems and any effects the use of ferromagnetic materials in pavement surface layers may physically have on tires, personnel, or the potential for foreign object debris. Subcommittee recommends that the FAA prioritize research projects that are close to completion such as the regarding trapezoidal grooving project.

FAA Response DRAFT: The FAA concurs with the Committee's finding and is undertaking the following actions to address its recommendation(s): The FAA's Airport Technology Research Branch (ATR) will investigate potential safety risks associated with the incorporation of heated pavement materials and techniques on airports. Specifically, electrical and electromagnetic risks will be investigated. The potential for Foreign Object Debris will also be addressed.

REDAC Recommendations

Fall 2017 – Reviewed 3/20/18 – Tentatively Approved

Finding 3 – LED Lighting Research

Some Subcommittee members expressed concern during FAA presentations on light emitting diode (LED) lighting systems research that LED runway edge lights do not emit light Omni directionally in the same manner as their incandescent counterparts, potentially making airfields equipped with LED edge lights more difficult for pilots to see at night.

Recommendation: The Subcommittee recommends that the FAA expand evaluation of LED runway edge lights to include airfield conspicuity considerations.

FAA Response DRAFT: The FAA concurs with the Committee's finding and is undertaking the following actions to address its recommendation(s): The FAA's Airport Technology Research Branch (ATR) will expand its evaluation of LED runway edge lights to include airfield conspicuity considerations. A plan of this proposed evaluation will be presented at the upcoming subcommittee meeting.

REDAC Recommendations

Fall 2017 – Reviewed 3/20/18 – Tentatively Approved

Finding 4 – Improving Awareness of Other REDAC Research Programs and Opportunities for Cross-Program Collaboration

Based in part on the discussion of research projects that involve other REDAC Subcommittees, including noise research that involves the Environmental & Energy Subcommittee, runway braking and runway incursion mitigation research that involves the Human Factors and Aircraft Safety Subcommittees, and air traffic automation research that involves the NAS Operations Subcommittee- members expressed an interest in increasing its awareness of the research within the purview of the other four Subcommittees.

Recommendation: The Subcommittee recommends scheduling briefings from either designated members of other Subcommittees or their FAA counterparts on research areas and/or projects that have implications for the Airport Technologies research portfolio during the Airports Subcommittee's meetings and notes that it has already been doing so successfully with the Environmental & Energy Subcommittee for the last 4 to 5 REDAC meeting cycles.

FAA Response DRAFT: The FAA concurs with the Committee's finding and is undertaking the following actions to address its recommendation(s): The FAA's Airport Technology Research Branch (ATR) will reach out to other REDAC subcommittees and FAA counterparts to maximize cross-program collaboration. In coordination with the Airports Sub-committee chair, members of other subcommittees and FAA will be invited to participate and present in the upcoming airports subcommittee meetings. The FAA's Airport Technology Research Branch will send representatives to participate in other subcommittee's meetings.

REDAC Recommendations

Spring 2018 – DRAFT for Discussion Purposes Only

Finding 1 – Commercial Spaceport Standards

The Subcommittee is pleased that Program staff have begun researching safety and design standards for commercial spaceports. We believe that this research should be coordinated with the recently-established and rapidly-moving commercial airspace aviation rulemaking committees (ARCs), principally the Spaceport Categorization ARC.

Recommendation: The Subcommittee recommends that the Airport Technology Research Program staff coordinate with the Office of Airports to ensure that other FAA Stakeholders are aware of the ongoing ATR research project and that relevant information be shared with those stakeholders.

FAA Response DRAFT: The FAA concurs with the Committee's finding and is undertaking the following actions to address its recommendation(s): The FAA's Airport Technology Research Branch (ATR) will coordinate with the Office of Airports (ARP) to ensure awareness by other FAA Stakeholders of ongoing spaceport-related research conducted by ATR. Appropriate and relevant information will be shared with other FAA Stakeholders.

REDAC Recommendations

Spring 2018 – DRAFT for Discussion Purposes Only

Finding 2 – Future Research and Facilities Prioritizations

As was the case at our Fall 2017 meeting, the Subcommittee placed a high priority on research into new categories of aeronautical vehicles- UAS and commercial space vehicles specifically- and their potential impacts on airport safety, operations, and infrastructure. Other high priority research areas are (1) pilot perception of flight emitting diode (LED)-based airfield lighting systems (RPA S5), (2) aircraft rescue and firefighting (ARFF) agents (RPA S5), (3) runway incursion prevention technologies (RPA S1), and (4) noise standard development/refinement based on the Findings of ongoing noise annoyance data collection (RPAs N2-N5). In order to facilitate ARFF research and store valuable ARFF test equipment and vehicles, the Subcommittee also finds construction of the fire safety building to be a high priority.

Recommendation: The Subcommittee continues to recommend that the FAA Office of Airports place a high priority on research and facilities noted in Finding 2.

FAA Response DRAFT: The FAA concurs with the Committee's finding and is undertaking the following actions to address its recommendation(s): The FAA's Office of Airports is placing high priority on all the areas identified in Finding #2, and the FAA's Airport Technology Research Branch (ATR) is planning to initiate bidding and construction of the fire safety research facility at the Technical Center in the Summer of 2018.

REDAC Recommendations

Spring 2018 – DRAFT for Discussion Purposes Only

Finding 3 – Collaborative Aircraft Braking Research

The Subcommittee remains pleased by the FAA's involvement of a Working Group of subject matter experts (SMEs) to reassess aircraft braking research. Given that the Working Group's efforts span multiple subcommittees' areas of expertise, it will be important to coordinate its work across relevant subcommittees.

Recommendation: The Subcommittee recommends that the Findings and proposed approach to future braking research developed by the Aircraft Braking Working Group be coordinated with relevant subcommittees, namely Human Factors, Aircraft Safety, and NAS Operations. This coordination can take the form of briefings to each of these Subcommittees at their Summer/Fall 2018 meetings if time permits.

FAA Response DRAFT: The FAA concurs with the Committee's finding and is undertaking the following actions to address its recommendation(s): The FAA's Airport Technology Research Branch (ATR) will coordinate with other subcommittees to plan for in-depth briefings of the "white paper" that was developed by the Aircraft Braking Working Group in 2017-18. These in-depth briefings will be presented at each of the other subcommittee meetings, by a member of the working group, beginning in the summer of 2018.

REDAC Recommendations

Spring 2018 – DRAFT for Discussion Purposes Only

Finding 4 – Trapezoidal Runway Grooving

The Subcommittee understands that safety, technical, and operational issues may preclude effective testing of trapezoidal runway grooving in a worn configuration (e.g., grooving "worn" to a half-depth condition) at Atlantic City International Airport. These issues, which include challenges in getting the Tech Center's B727 aircraft braking test bed to a high enough speed to appropriately simulate landing aircraft braking performance, concerns on the part of the airport operator that half-depth grooving could compromise actual aircraft landing performance, and limited test durations driven by these concerns.

Recommendation: The Subcommittee recommends that the FAA reconsider ways in which the performance of worn trapezoidal grooves - both in terms of drainage and effects on aircraft braking - can be evaluated, including through cooperation with other countries' Civil Aviation Authorities where trapezoidal grooves have been installed on active runways (e.g., Singapore).

FAA Response DRAFT: The FAA concurs with the Committee's finding and is undertaking the following actions to address its recommendation(s): The FAA's Airport Technology Research Branch (ATR) will research and propose alternate ways to study the performance of worn trapezoidal grooves to the FAA's Office of Airports (ARP). Decisions on how to proceed will be made in coordination with ARP.

REDAC Recommendations

Spring 2018 – DRAFT for Discussion Purposes Only

Finding 5 – National Airport Pavement Testing Facility

The National Airport Pavement Testing Facility (NAPTF) in Atlantic City, a proven national aviation asset, requires maintenance investments, specifically a roof replacement to ensure its continuing functionality.

Recommendation: The Subcommittee recommends moving forward with plans to replace the roof of the NAPTF as soon as practicable.

FAA Response DRAFT: The FAA concurs with the Committee's finding and is undertaking the following actions to address its recommendation(s): Over the course of two fiscal years (FY-18 and FY-19), the FAA's Airport Technology Research Branch (ATR) will be installing a heavy duty elastomeric acrylic coating on the whole length of the National Airport Pavement Testing Facility (NAPTF) roof. This added coating, together with a new lightning protection system, will effectively permit the existing roof to function as a new roof.

REDAC Recommendations

Fall 2018 – DRAFT for Discussion Purposes Only

Finding 1 – Commercial Airspace Aviation Rulemaking

The Subcommittee remains pleased that the FAA's Airport Technology Research Branch has begun researching safety and design standards for commercial spaceports, but continues to feel that more substantial outreach is needed with the concurrent efforts of commercial airspace aviation rulemaking committees (ARCs), principally the Spaceport Categorization ARC.

Recommendation: The Subcommittee recommends that the FAA's Office of Airports together with the Airport Technology Research Branch directly coordinates with the Spaceport Categorization ARC and, to the extent it is pertinent, the Airspace Access Priorities ARC to ensure that their research informs (and is informed by) the ARCs.

FAA Response DRAFT: **The FAA concurs with the Committee's recommendation(s) and with the noted exceptions and clarifications intends to undertake the following actions to address its recommendation(s):** The Airport Technology Research Branch will continue to work with the Office of Airports (ARP) in finalizing the findings from the ongoing Gap Analysis study of ARP regulations and standards as they pertain to Commercial Space applications, with a focus on vehicle profiles and their effects on airport infrastructure and equipment. Due to the sensitive nature of the information gathered for this research effort, the Office of Commercial Space Transportation (AST) will review the findings and determine what information can be shared with the ARCs. It is expected that the findings will shared with the ARCs in FY-19, 4th Quarter.

REDAC Recommendations

Fall 2018 – DRAFT for Discussion Purposes Only

Finding 2 – Cybersecurity R&D Plan

The Subcommittee was pleased to receive an update regarding the FAA's Cybersecurity R&D Plan and learn more about how various FAA R&D programs are expected to support it. We agree with the FAA that there needs to be more awareness and involvement from airports in the development and refinement of this Plan.

Recommendation: The Subcommittee recommends that the FAA work with the Subcommittee members and other subject matter experts at airports to ensure that the FAA Cybersecurity R&D Plan appropriately reflects airport operators' roles, responsibilities, and involvement in aviation cybersecurity in the United States.

FAA Response DRAFT: **The FAA concurs with the Committee's finding and recommendation and is undertaking the following actions to address its recommendation:** The Airport Technology Research Branch will engage the FAA Cybersecurity R&D team, located at the Technical Center to coordinate discussions with the Office of Airports and pertinent Subcommittee members, to ensure that the FAA Cybersecurity R&D Plan appropriately reflects airport operators' roles, responsibilities, and involvement in aviation cybersecurity in the United States. The completion date is FY-19, 4th Quarter.

REDAC Recommendations

Fall 2018 – DRAFT for Discussion Purposes Only

Finding 3 – PFAS Part 1 (Foam Proportioning Systems)

Over the past year, several U.S. States and municipalities have been focusing their attention on environmental contamination by per- and polyfluoroalkyl substances (PFAS), classes of fluorinated hydrocarbon molecules that can lead to adverse health outcomes in humans. In addition to their potential toxicity, most forms of PFAS do not readily breakdown in the environment and bio accumulates in those that are exposed to the substances.

One of the areas that PFAS is used is in aqueous film-forming foam (AFFF) which is used to suppress and extinguish aircraft fuel fires. Under current FAA regulations, certificated airports are required to use fluorinated AFFF because of the high level of performance AFFF provides (e.g., ease of dispensing via current ARFF equipment, fire knockdown times, fire burn-through times). This said, over the last decade there have been numerous fluorine-free foams (3F) that have come onto the market and are being used at airports around the world.

Research into the performance of these new foams has been spotty and often seems to be vendor-sponsored, leaving considerable uncertainty about the efficacy of these foams. There are also are a number of questions about the foam performance standards that the FAA uses—which are taken from Military Specifications—that make it challenging to evaluate whether the safety benefits associated with AFFF outweigh the potential environmental hazards associated with PFAS. The Airport Cooperative Research Program's (ACRP) Report 173 does state that fluorine-free foams meet the requirements of the International Civil Aviation Organization for fire extinguishing performance. The ACRP Report 173 also finds, "Fluorine-free foams have been shown to not have the same performance as their fluorinated counterparts. They are currently not able to provide the same level of fire suppression capability, flexibility, applicability, and scope of usage as AFFF firefighting foams. An analysis of the performance of two available fluorine-free foams found that they would need to be replenished three more often than AFFF to provide the same level of protection."

REDAC Recommendations

Fall 2018 – DRAFT for Discussion Purposes Only

Finding 3 – PFAS Part 1 (Foam Proportioning Systems) CONTINUED

The report also states, "Further research is warranted on whether AFFF alternatives available outside North America can or should be acceptable (e.g., through specification requirement changes, product approvals, or advances in foam development)."

In addition, the Subcommittee notes that there are other areas in which the FAA can assist airports in limiting release of PFAS into the environment—specifically through reducing the need for or eliminating entirely ARFF equipment testing procedures that require discharge of PFAS-containing AFFF into the environment. Research into technologies and procedures would reduce the need for and quantity of AFFF released during ARFF equipment testing, inspections, and training has been underway under RPA S3 for several years and includes the evaluation of alternative foam proportioning system testing systems and revisions to ARFF equipment certification tests.

Recommendation: The Subcommittee strongly recommends that the FAA expedite completion of ongoing research efforts relating to foam proportioning systems. The Subcommittee also strongly encourages the FAA to revisit firefighting foam research and ensure that there are scientifically-based mechanisms/testing protocols for evaluating fluorine-free foams in the civil aviation sector, ideally using the newly-commissioned and state-of-the-art fire testing facility at the FAA Technical Center.

FAA Response DRAFT: **The FAA concurs with the Committee's finding and recommendation and is undertaking the following actions to address its recommendation**:

1) The ATR ARFF Research Program and the Office of Airports is planning to complete the evaluation and draft report on three technologies of foam proportioning system testing devices in December 2018. The draft report will be reviewed and is expected to be ready for public release within the first quarter of calendar year 2019.

REDAC Recommendations

Fall 2018 – DRAFT for Discussion Purposes Only

Finding 3 – PFAS Part 1 (Foam Proportioning Systems) CONTINUED

2) The other aspect of the recommendation refers to the search for a fluorine-free replacement for current AFFF chemistries. The ATR ARFF Research Program is beginning the process of investigating currently available fluorine-free products for viable candidates for future fire extinguishing performance testing. The process will also include potential modification to existing chemistries to improve fire-fighting performance. Selection of potential candidate products for fire testing will begin in the third quarter of calendar year 2019.

3) Fire extinguishing performance testing using the new fire research facility currently under construction will begin by the end of calendar year 2019. This research will be a top priority and the anticipated schedule is to have a report on viable candidate replacement chemistries by the fourth quarter of 2021.

REDAC Recommendations

Fall 2018 – DRAFT for Discussion Purposes Only

Finding 4 – PFAS Part 2 (Gap Analysis)

(See finding language from Finding 3)

Recommendation: We (the Subcommittee) also recommend that the Airport Technology Research Programs perform a gap analysis of research regarding the health and environmental hazards associated with fluorinated AFFF use at airports and work with the Subcommittee to determine how these gaps can be addressed either within or externally to the FAA Research Programs.

FAA Response DRAFT: **The FAA concurs with the Committee's finding and recommendation and is undertaking the following actions to address its recommendation**: The ATR ARFF Research Program will perform a gap analysis of research regarding the health and environmental hazards associated with fluorinated AFFF use at airports. The gap analysis will be performed concurrently with the literature review search for fluorine-free alternatives starting in the first quarter of calendar year 2019. The gap analysis is scheduled for completion at the end of the second quarter of calendar year 2019. Gap analysis results are planned to be presented in the Summer meeting of the subcommittee, where discussion can take place on how to best address potential gaps.

REDAC Recommendations

Fall 2018 – DRAFT for Discussion Purposes Only

Finding 5 – DOT/FAA Strategic Research

The Subcommittee appreciates the direction the FAA is receiving from the U.S. Department of Transportation regarding the alignment of FAA research with DOT's broader strategic research priorities. We additionally note that ongoing research associated with Unmanned Aircraft Systems and Commercial Space appear to be areas where there is significant existing alignment between FAA and DOT/Trump Administration priorities and directly involve airport research interests.

Research into the facilitation of transcontinental supersonic aircraft operations, pavement research focusing on extending longevity of runways, taxiways, and aprons, and many of the airport safety research projects currently underway within the Airport Technologies Research program are similarly situated.

Recommendation: The Subcommittee recommends including discussions of the alignment of the Airport Technologies Research program with broader DOT and FAA strategic research goals in each of our face-to-face meetings.

FAA Response DRAFT: **The FAA concurs with the Committee's finding and recommendation and is undertaking the following actions to address its recommendation**: The FAA concurs with the Committee's finding and recommendation and is undertaking the following actions to address its recommendation. The Airport Technology Research Branch will review, present and include discussions of the alignment of the Airport Technologies Research program with broader DOT and FAA strategic research at future Subcommittee meetings. It should be noted that the Airport Technology Research Branch together with the Office of Airports are actively engaged in the ongoing development of various FAA strategic research documents. Date of completion is 4th Quarter, 2019.

REDAC Recommendations

Fall 2018 – DRAFT for Discussion Purposes Only

Finding 6 – Strategic Program Focus Part 1 (Agenda)
The Subcommittee found that the shortened agenda for this Subcommittee meeting—although driven by events beyond the Subcommittee's control— did expedite discussion of key program topics and kept research program discussions at a more appropriate strategic level than prior meetings. In addition, the incorporation of web/teleconference access to the meeting ensured broader participation of Subcommittee members than would have been otherwise possible.

Recommendation: Although we do currently plan to meet for two days at our March 2019 meeting, the Subcommittee recommends continuing the precedent set at the summer 2018. This includes organizing the agenda for this meeting to focus on strategic reviews of Airport Technologies Research Program, its connections with other FAA research programs—notably the Environment & Energy Research Program, and alignment with DOT research priorities.

We understand that this would come at the expense of more comprehensive and detailed reviews of individual research projects. To ensure that reviews of projects of particular interest are not missed, the Subcommittee proposes to identify 4-5 projects for deeper technical discussion in collaboration with the FAA Research Program leadership a month or so prior to each face-to- face meeting.

FAA Response DRAFT: **The FAA concurs with the Committee's finding and recommendation and is undertaking the following actions to address its recommendation**: The Airport Technology Research Branch will coordinate with the Subcommittee chair to develop subcommittee meeting agendas that, along with selected project reviews, provide strategic reviews of Airport Technologies Research Program and its connections with other FAA research programs, as well as alignment with DOT research priorities. Expected Date of Completion: Feb 15, 2019.

REDAC Recommendations

Fall 2018 – DRAFT for Discussion Purposes Only

Finding 7 – Strategic Program Focus Part 2 (Web/Teleconference Access)
The Subcommittee found that the shortened agenda for this Subcommittee meeting—although driven by events beyond the Subcommittee's control— did expedite discussion of key program topics and kept research program discussions at a more appropriate strategic level than prior meetings. In addition, the incorporation of web/teleconference access to the meeting ensured broader participation of Subcommittee members than would have been otherwise possible.

Recommendation: The Subcommittee also recommends that the FAA continues to provide web/teleconference access for Subcommittee members that are unable to attend the meeting in person either due to financial or time constraints.

FAA Response DRAFT: **The FAA concurs with the Committee's finding and recommendation and is undertaking the following actions to address its recommendation**: The Airport Technology Research Branch will provide web/teleconference access for Subcommittee members that are unable to physically attend the meeting. Date of completion: On-going service.

Airport Technology R&D

FAA William J. Hughes Technical Center

Airport Technology Research Branch

ANG-E26, Building 296

Atlantic City International Airport, NJ 08405

Jim.Patterson@faa.gov 609-485-4989

www.airporttech.tc.faa.gov