

**Research, Engineering and Development Advisory Committee (REDAC) MINUTES**

**Meeting Date and Time:** 10/10/2019 – 9:00 AM    **Meeting Location:** FAA – McCracken Room, 800 Independence Avenue SW, Washington,DC

<b>Purpose</b>	REDAC Guidance on the FY 2022 Research and Development Portfolio
<b>Facilitator</b>	Dr. John Hansman, <i>REDAC Chairperson, MIT</i> ; Ms. Shelley Yak, <i>FAA WJHTC Director and REDAC Designated Federal Official</i>
<b>Note Taker</b>	Mark Hale

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**Presentation:** Welcome and Opening Remarks  
**Presenter(s):** *Dr. John Hansman, Ms. Shelley Yak*

Ms. Shelley Yak (Director, FAA William J. Hughes Technical Center) announced the public meeting notice as required and provided an introduction and updates to committee members. Ms. Yak thanked attendees for their presence and commitment to the Research, Engineering and Development (RE&D) Advisory Committee (REDAC). Ms. Yak spoke about the historical challenge of developing a comprehensive overview of the FAA’s Research and Development (R&D) portfolio as a whole. Ms. Yak described the FAA’s approach to answering this challenge as a three-part approach. The first step in answering this challenge was the development of the research domain areas. Following this work, the second initiative was a redesigned National Aviation Research Plan (NARP). The 2017/2018 version of the NARP has now been officially released and posted on the web. Ms. Yak thanked the REDAC for help in undertaking this effort. Ms. Yak then spoke about the third part of this approach, the Aviation R&D Landscape (or simply “Landscape”) effort. The Landscape is a single reference that provides R&D management more insight into what industries’ R&D focus is, and the actions they are taking. The alignment to domain areas, updated NARP structure, and the Landscape will enable more productive discussions within the REDAC and aviation industry.

Dr. John Hansman (REDAC Chair) thanked the REDAC for their presence, commitment, and diligent work. Dr. Hansman reviewed the day’s schedule and offered administrative notes.

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**Presentation:** FAA Opening Remarks  
**Presenter(s):** *Carl Burleson, Pam Whitley*

Mr. Carl Burleson (FAA, Acting Deputy Director) welcomed participants and spoke about the importance of innovation and the exciting future of aviation. Mr. Burleson spoke about the level of innovation that is occurring presently and how it was unprecedented in terms of new entrants and missions. Mr. Burleson spoke about the need to restructure the FAA to best collaborate with industry, and best position the Agency to allow innovation given the practical resource constraints

facing the FAA.

Ms. Pam Whitley (FAA, Acting Assistant Administrator for NextGen) thanked the committee for their time and service. Ms. Whitley referenced how the FAA must become more agile in the entire lifecycle and adopt different ways of looking at research. She stated that the FAA needed a better connection between industry investments, the research the FAA does, and the way that those things will change and challenge the work that the FAA does through its research portfolio. She noted that the Landscape work that has been done is the beginning of creating this big industry discussion as the Agency plans for the FAA of the future.

Ms. Whitley spoke about the progress of NextGen, with most of the analog systems having been replaced with digital equivalents and advancements. These systems are now within the Air Traffic Organization (ATO) to integrate and leverage the technology and equipment to modify operations and maximize the usefulness of these new advances.

Mr. Ian Redhead (Environment and Energy Subcommittee Chair) asked about leadership succession as people in FAA leadership retire or move on from the FAA. Mr. Redhead commented on the loss of institutional knowledge and questioned how the FAA will fill those voids. Mr. Redhead suggested that the FAA will be competing for talent with companies like Amazon and will impact the way we do business and how we get new talent. Mr. Burluson indicated that a workforce summit with industry and academia was held last year that focused on the issue of workforce development. A large effort has been put together examining how to attract more young talent.

Dr. Hansman spoke about how the FAA can't compete with Amazon and instead suggested that the FAA needs to bring in aviation enthusiasts. The FAA needs to consider if there are things that can be done to reduce barriers and accelerate innovation to help attract young talent.

Mr. Leo Prusak (NAS Operations Subcommittee Chair) offered, "What holds us back is access to data. Industry needs access to data. There are things that industry can do from their perspective if they have access to more data." Mr. Prusak used ride sharing as an example of an industry that carries more people on any given day than the aviation industry, yet they did not invent GPS signals but instead, leverage the data and technologies that were already available to innovate in a very unique way.

Mr. Burluson mentioned a meeting with the new FAA administrator previously. During this meeting the administrator talked about data and large databases and how the FAA can more fully exploit that data. He also added that the FAA recognizes that data access is an ongoing issue and is working to figure out how best to make more data available.

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**Presentation:** FAA R&D Landscape Update

**Presenter:** *Steve Summer*

Mr. Steve Summer (Manager, FAA Research Portfolio Planning Branch) presented a brief overview regarding the Aviation R&D Landscape. He defined the landscape as a collection of research drivers over the next ten year time period that will stimulate R&D investment. The identified drivers will impact industry objectives, emerging technology, and envisioned operations. The landscape will help

to ensure that the FAA’s research portfolio properly aligns to the drivers to best enable aviation industry innovation. Mr. Summer noted that as research products are completed and implemented in the aviation system the landscape would subsequently change. Therefore, the aviation R&D landscape is not a static set of research drivers but rather a dynamic set that requires continued validation.

Dr. Hansman asked how the FAA defined driver “time to maturity.” Mr. Summer stated that this was the anticipated time frame that the driver would start impacting the industry. Dr. Hansman offered that part of the reason for doing research is to meet the unique research needs of the FAA. He continued, “The question is when the FAA needs this knowledge to make informed decisions? This is in-time research. For example, an organization is going to show up with a hybrid electric aircraft and ask how they can certify it. That will force the FAA to make less informed decisions than if the FAA is more forward looking.” Ms. Yak commented that the FAA is looking to partner earlier with industry and that the R&D landscape effort would aid in this endeavor.

Dr. Hansman stated that the challenge with the FAA R&D portfolio is that the Agency must plan and budget for the future without knowing exactly what the future holds. For example, if near term emerging research needs are being considered – that already needs to be in the research portfolio from previous planning cycles. Dr. Hansman suggested that there should be resources set aside that are not part of the normal “research enterprise” process that would be for emergent requirements or critical “pop up” research needs.

Mr. Burluson added that the Agency underestimated how large and fast UAS would emerge. He stated that as an Agency, the FAA recognizes that pace of change is going to accelerate and that, “We have to adapt. Because our process is complex, we have a great challenge ahead of us as we look to operate in a more flexible way. This is particularly challenging given the budgetary process and how congress appropriates money.”

Mr. Summer continued the presentation by describing the process used to identify the research drivers through involvement with REDAC subcommittees. The research drivers were analyzed and placed into four main categories. Three of these driver categories were largely industry focused, whereas the fourth category was an FAA-focused system wide advancements and improvements. Mr. Summer stated that the FAA is looking to match its research to these drivers and to the National Aviation Research Plan (NARP). This process will allow a gap analysis to ensure the FAA’s portfolio is comprehensive and meets the needs of the aviation industry moving forward.

Dr. Hansman suggested that the landscape product be released as a version 1 as opposed to a draft version so that it has more credibility with those that will potentially use the document.

Mr. Prusak stated that the NAS Operations Subcommittee would like to request an example of the landscape product being used to see how it impacts decisions.

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**Presentation:** FAA UAS Update

**Presenter(s):** *Jay Merkle, Sabrina Saunders-Hodge*

Mr. Jay Merkle (FAA, Executive Director of Unmanned Aircraft Systems Integration Office) gave a historical overview of the Unmanned Aircraft Systems (UAS) integration strategy. He described a strategic shift away from a rulemaking-first approach, to an operations-first approach. There has been significant progress made in this area because of this shift. Mr. Merkle presented a status on various activities related to both regulatory and air traffic/air navigation service provider services. Mr. Merkle stated that there were already several applicants seeking design approvals that were on current type-certificated aircraft or brand new aircraft that was either pilot optional, safety pilot, or no pilot in the cockpit. These aircraft would all operate at over one thousand pounds generally. They are also examining electric helicopters for commuter-based urban air mobility where there would likely be no pilot at all. Mr. Merkle admitted that this was a challenge for air traffic certification, and it will be a challenge in the near term as companies are looking to start testing these flights soon, including some looking to enter revenue service by 2024.

Dr. Hansman asked how the FAA parsed certification and operational approval of these new entrants. Mr. Merkle responded by saying the old process was a stovepipe process whereas the new approach being used is bringing in all relevant parties from the beginning such as, certification, flight standards, and air navigation service providers. We must now look at the complete set of issues from the beginning that must be addressed in order to be effective and efficient as an Agency, and to best enable industry innovation

Mr. Merkle spoke about activities conducted by Google Wing. Wing partnered with nine UAS Service Suppliers (USS) and UAS operators to demonstrate the remote identification of drones in San Bruno, CA. The demonstration showed that network remote ID based on the American Society for Testing and Materials (ASTM) standard was effective, supported a diverse range of drone operators, and can be implemented today. Mr. Merkle stated that the remote ID rule was anticipated to come out in December, 2019. He noted that the UAS integration office was establishing a cross-agency team to run the implementation of Remote ID as a program, determine membership, and define the scope of the program while establishing governance. Mr. Merkle spoke about the pace of innovation in this area. Industry is not waiting for the FAA, they are investing and innovating. The FAA has to keep up with the pace of innovation.

Mr. Merkle gave an update on the FAA Integration Pilot Program (IPP) which awarded the first agreements in May 2018, and started flying in September 2018. There have been a significant number of flights with over seven thousand sorties already under this program and approximately 2,000 flight hours. The program is simultaneously tackling beyond visual line-of-sight (BVLOS), night operations, multi operations, part 135 and exemptions, operations over people, and other part 107 operations. Mr. Merkle stated that he believes there are different types of market groups emerging based on observations, those who can operate in visual line-of-sight (VLOS) or with waivers (e.g., night operations), and those who are logistics stakeholders who are moving in the part 135 direction.

Dr. Hansman mentioned that the waivers for operations granted were to enable FAA researchers and industry to gain knowledge. Dr. Hansman asked about the progress on this front. Mr. Merkle stated that they are making the certificates of waiver or authorization (COA) process online so people can

see the patterns that get approved. In addition, precedence-setting exemptions are posted in the federal register so that it is available to industry. For example, UPS Flight Forward gave the FAA feedback on the usefulness of using the Google Wing exemption as a model. This gave them a lot of input on how to do their exemption. Similarly, Amazon is following suit by leveraging the information from the publically available processes to innovate and gain their exemptions.

Mr. Merkle explained that there are disadvantages to trying to extend part 107 all the way to beyond visual line of sight (BVLOS). He stated that inherently it is a visual line of sight rule. Because it relies on exemptions it doesn't have the air worthiness backing. The FAA is quickly either moving these operators out of part 107 and into part 135, or will start moving them into other operations later this fall.

Mr. Merkle proceeded to give updates on IPP/Partnership for Safety Plan (PSP) waivers and exemptions. Specifically, he updated the progress of Wing (IPP), Xcel Energy (PSP), North Dakota (IPP), Amazon (PSP), and UPS/Matternet (IPP). Mr. Merkle stated that industry is making very good progress through this program and that senior FAA leadership is spending much more time working with and talking to them so that they can overcome bureaucracy and get problems addressed efficiently. He then concluded by saying that private industry investment in these areas is very substantial. The FAA is continuing its research to expand its core knowledge base to best enable transformative research and investment by industry.

Mr. Ian Redhead noted that his biggest concern is that industry is moving so fast, without guidance from the FAA, and they may be developing their own rules and/or procedures that may be in conflict with eventual FAA rules and guidance. Mr. Redhead also asked if the FAA is fully engaged in community outreach (state, local, etc.) to learn unique community challenges and/or constraints. Mr. Merkle stated that the IPP enables community involvement to gain their input into these operations and address any concerns that they might have.

Mr. John Dermody (FAA, Director – Office of Airport Safety and Standards and DFO) spoke about drones for airport purposes including research being conducted at the FAA's William J. Hughes Technical Center (WJHTC). The applications of this research serve many purposes from surveying and inspection to surveillance and security applications. The FAA is done with phase one of this research and will be looking to better understand the pros/cons of drones in the airport environment and develop performance specifications. The Federal government (e.g., FAA, DOD, Homeland Security, etc.) also must come up with a solution for the interactions between drones and airspace that is traditionally used for manned flight. There is language in the congressional reauthorization that mandates the FAA to research these issues, including counter-UAS measures.

Mr. Chris Oswald (Airport Subcommittee Chair) reiterated the criticality of the remote identification for drones. He stated that this is a multi-agency issue. He also stated that there are crucial concerns about how this research gets propagated across agencies (e.g., DOJ, DOD, DHS, etc.).

Ms. Sabrina Saunders-Hodge (FAA, Director – Unmanned Aircraft Systems) provided historical background on the beginnings of the FAA's UAS integration office. The UAS integration office was created to figure out gaps and interdependencies between FAA systems, users, and UAS. She commented that the office is learning every day from these operations (e.g., part 107) and stakeholder

feedback, while continuously assessing knowledge gaps. This information feeds into the understanding of the process for operations over people, and all the things industry wants to do with operations in the NAS. Ms. Saunders-Hodge then spoke about research partners and how they are collaborating in a constantly evolving and informing process.

Ms. Saunders-Hodge concluded her briefing emphasizing the importance of the work being done on ground collision severity studies that will inform decisions and approaches on operations over people, and the airborne collision severity work being done that will ultimately inform BVLOS operations.

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**Presentation:** Subcommittee Report: Environment & Energy

**Presenter:** *Ian Redhead, Subcommittee Chair*

Mr. Redhead updated the REDAC on the Environment and Energy Subcommittee meeting held in September 2019. During this meeting the subcommittee reviewed the research portfolio and were able to observe some of the results of the work being done. He stated that the biggest threats to future aviation growth from the Environment and Energy Subcommittee's perspective would be the noise impact of UAS, UAM, supersonic aircraft, and commercial space flight.

Mr. Redhead continued by stating that it is very important for the FAA to keep its leadership at the International Civil Aviation Organization (ICAO) Committee on Aviation Environmental Protection (CAEP). He then described selected topics from the subcommittee meeting including new entrants, the importance of public-private partnership programs, and the FAA's continuing collaboration with NASA. He continued by saying that the maturation of the alternative jet fuel program will be a major environmental benefit for the public, will create a new industry within the U.S., and will benefit the U.S. aviation industry. The Environment and Energy subcommittee strongly supports funding for the continuation of research on alternative jet fuels.

Mr. Redhead stated that the subcommittee continues to endorse the robust funding of Public/Private partnerships like CLEEN, CAAFI, and ASCENT that leverage scarce resources. He also added that the subcommittee encourages the FAA to further streamline the process to reduce the time required to go from idea development to grant execution.

The subcommittee stated that proposed improvements in the Aviation Environmental Design Tool (AEDT) will enable enhanced usability and improved airspace and airport design. The subcommittee recommended that the FAA continue the simultaneous development of usability improvements and enhanced features in the near term, and that the FAA work with airports to get additional emissions data to support modeling efforts.

Mr. Redhead continued by stating that staff vacancies within the FAA organization are a big concern given the substantial workload increase within The Office of Energy Research and Development (AEE). Currently this organization does not have the full complement of staff required to maintain research and provide the solutions that the FAA needs in order to achieve its core mission. The subcommittee recommends the FAA place a high priority on filling staff vacancies to manage the AEE portfolio and support the expanding workload.

Dr. Hansman remarked that in the time that he has been involved in the REDAC he has not seen such a push in sustainability from the aviation/airlines industry. He asked if the subcommittee felt similarly. Mr. Redhead concurred and pointed to his earlier recommendations on both noise and alternative jet fuel research. This is consistent with the approach the European Union is taking.

Mr. Kevin Welsh (FAA, Executive Director of the Office of Environment and Energy, AEE) spoke about the work being done by his office. In particular, he stated that a report was generated leading up to ICAO's assembly that highlighted the U.S.'s record on environmental issues related to aviation. The paper showed that since 1991, the U.S. sector has improved its efficiency by over 70%. He also stated that since the year 2000 we are using the same amount of aviation fuel per year but we are carrying about 30% more passengers. He also spoke about the challenges of obtaining international agreements.

Dr. Hansman stated, "I spoke to three Chief Technology Officers (CTO's) of major aerospace manufacturing organizations and this was the number one priority for them. They see this as a long term existential threat at the time-scale of CTO thinking."

Mr. Terry McVenes (Aircraft Safety Subcommittee Chair) commented that among the greatest challenges is the disparity in the regulatory environment between the U.S. and Europe. Mr. Welsh added that there is a lot of pressure in Europe for a long term climate goal for aviation. He stated that the challenge is coming up with a 2050 goal that is meaningful for the future but also for now.

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**Presentation:** Subcommittee Report: NAS Operations

**Presenter:** *Leo Prusak, Subcommittee Chair*

Mr. Prusak briefed the full REDAC on the NAS Operations Subcommittee's report. The first recommendation presented was a need for the FAA to establish a continuing capability utilization evaluation program. Mr. Prusak stated that with the growing complexity and inter-relationships between automation systems (e.g., TBFM, TSAS, TFDM, STARS, ERAM), and new procedures and capabilities, it is becoming increasingly important to monitor the use of these systems to ensure their envisioned benefits are being realized.

The subcommittee suggested that the FAA evaluate the potential benefits of the wake hazard research program and its application to general aviation that could be extended to the flight decks for business and commercial aviation. This includes the study of flight deck graphical wake avoidance advisories on mobile devices. The subcommittee feels that the FAA program office should develop a plan and strategy on how the enroute wake encounter data being gathered through ASRS and ASIAs are being leveraged and applied to inform research, as well as mitigation technologies and procedures.

Dr. Hansman asked Mr. Prusak to clarify where this recommendation came from. He stated concerns about distraction on the flight deck from mobile devices during visual conditions. Mr. Prusak stated that many flight decks are doing this and that this was something that the subcommittee believed was important.

The third recommendation given by the subcommittee was related to the Runway Incursion Reduction

Program (RIRP). Mr. Prusak stated his committee recommends that the program office develop a more detailed acquisition concept including a list of candidate airports, quantitative assessment of the safety or operational impact that deployment of the targeted technologies would achieve at these airports, and a notional process by which the program office would support these airports in the system development and acquisition process. Mr. Prusak requested that this information be presented to the subcommittee at the spring 2020 meeting.

The final recommendation from the NAS Operations Subcommittee was that the Weather Technology in the Cockpit (WTIC) program develop an end-to-end strategic plan and brief this to the subcommittee at the spring 2020 meeting. This should augment the existing material on stakeholders and metrics with a clearer statement of desired program outcomes, a process for optimizing the research projects selected for funding to achieve these outcomes, and a stronger explanation of why the projects briefed to the subcommittee are important to this strategy.

Mr. Prusak then spoke about a requested action item from the subcommittee regarding the use of the aviation R&D Landscape. The subcommittee requested an example of the aviation R&D Landscape framework for the purposes of evaluating the utility of using the framework.

Mr. Prusak concluded with two deep dive information requests. First, the subcommittee requests that the Commercial Space Transportation program provide a deep dive briefing regarding the methods in development for launch vehicle-to-aircraft trajectory separation management, its expected improvement in NAS operations, and deployment strategy. This should include an update on the development of the commercial space Concept of Operations (CONOPS) as well as an examination of how the commercial space program's forecasts are informed.

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**Presentation:** Subcommittee Report: Airports

**Presenter:** *Chris Oswald, Subcommittee Chair*

Mr. Oswald gave an update regarding the Airport subcommittee's meeting. During the July 2019 meeting the subcommittee received briefings on the Aviation R&D Landscape for the NAS: 2020-2030, Aircraft braking friction research, and the aircraft firefighting agent testing program. Mr. Oswald stated that the subcommittee is supportive of this strategic approach to prioritizing FAA research and development activities. Subcommittee members view the aviation R&D Landscape as a key mechanism for identifying and motivating crosscutting research activities. The Subcommittee also believes that it should continue to be involved with development of the Aviation R&D Landscape and assisting with translating the research needs articulated within it into meaningful research projects. In addition, the Airports Subcommittee recommends allocating time during each of its semi-annual meetings for discussion of the Aviation R&D Landscape. The purpose of this would be to provide recommendations and guidance regarding how the Airport Technology Research & Development Branch can move airport safety, planning, design, and engineering research priorities forward.

Mr. Oswald continued stating that the subcommittee recognizes that the Airport Technology Research & Development Branch has a leading role in developing performance standards and use guidance for airport-deployable UAS detection systems if these systems will be eligible for FAA grant funding.

The subcommittee strongly recommends that the FAA expedite this UAS detection system research.

The third recommendation presented by Mr. Oswald was that the FAA should proceed with all due speed with evaluation of the performance of alternatives to PFAS-based firefighting agents in the civil aviation sector including completing and commissioning its new fire safety test building at the William J. Hughes Technical Center. The subcommittee requests that the FAA provide updates prior to subcommittee meetings if unexpected events or circumstances delay this research. They also recommend that the FAA coordinate this research with subject-matter experts in industry, including the potential establishment of an expert advisory panel similar to expert panels that have been established in other research areas.

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**Presentation:** Subcommittee Report: Human Factors

**Presenter:** *Barbara Holder, Subcommittee Chair*

Dr. Holder briefed the REDAC on the Human Factors subcommittee's last meeting held in August 2019. She informed the committee that the objective of the meeting was to provide strategic guidance to the FAA to develop the upcoming FY+3 research portfolio. The subcommittee reviewed the past year's activities/accomplishments and reviewed the proposed focal areas.

Dr. Holder noted that the committee collected and reviewed inputs to update their human factors emerging issues list which will be briefed and discussed at the subcommittee's Winter/Spring 2020 meeting.

Dr. Holder briefed the subcommittee's findings and recommendations. The first recommendation was that the FAA identify opportunities where research would benefit from integrated studies and be accomplished within the constraints of current funding and available resources. The reason behind this recommendation is that the FAA's budgetary structure forces research to focus on the flight crew and air traffic controllers separately. The study of these domains separately generally yield different products for each domain, rather than more unified tools, technologies, and procedures. This leads to duplication of effort and a high potential for rework later on.

Dr. Holder briefed the REDAC on strategic inputs to the research prioritization process. The subcommittee suggests that the FAA define a research proposal and prioritization process to include strategic guidance regarding the development and integration of emerging needs, current issues, and operational concepts so these issues can be addressed proactively. This perspective should be driven by input from ATO, AVS, Tech Ops, and NextGen as well as industry to ensure the certification, regulatory, and operational needs of the Agency are considered relative to emerging needs and operational concepts. Dr. Holder expressed concern that by the time strategic inputs get into the process the subcommittee and FAA are already behind, causing the FAA to be reactive rather than proactive.

The final recommendation from this subcommittee was related to UAM. The subcommittee recommends that the FAA invest in human factors research related to increasingly automated operations as soon as possible. This should include FY22 research guidance provided by both ANG and AVS that specifies the need to address UAM human factors issues. This research should include

human-machine systems integration, pilot/operator training and certification, and airspace interoperability between traditional and UAM operations, as appropriate to the organization.

Dr. Hansman suggested that the area of short takeoff aircraft, as opposed to Vertical Takeoff and Landing (VTOL), may be a rapidly emerging area.

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**Presentation:** Subcommittee Report: Aircraft Safety

**Presenter:** *Terry McVenes, Subcommittee Chair*

Mr. McVenes briefed the REDAC on the Aircraft Safety subcommittee's August 2019 meeting. Mr. McVenes discussed the topics from this meeting which included a review of budgets and R&D appropriations, Aviation Safety Assurance Portfolio accomplishments, new processes for strategic guidance, software assurance challenges, UAS research updates, and the cybersecurity-safety commercial aviation team.

Mr. McVenes then briefed the REDAC on the Aircraft Safety subcommittee's findings and recommendations. The first finding stated that there should be a process (ideally as part of the appropriation process) to set aside a portion of the RE&D budget for discretionary efforts to address out-of-cycle emerging issues that are agreed to have a potential impact on aircraft safety. He stated that budget cycles significantly restrict the ability of the FAA to plan and conduct research in near-real time to address emerging issues.

The second recommendation of the Aircraft Safety Subcommittee was related to the AVS research planning processes. The subcommittee recommends that as the research proposal and selection process is refined, that guidance is issued for the use of R&D Landscapes and their associated research challenges, as reference for individuals proposing new research. The subcommittee also recommends that landscapes and challenges are considered as part of the selection rubric.

Mr. McVenes stated that the FAA is currently having to certify some very complex and non-deterministic systems that are part of emerging issues. Work is challenging in this area and issues such as verification and validation best practices need to be addressed. To address those challenges the committee recommends that the FY20 request for Digital System Safety funding should include some additional money in the areas of UAS. The FAA should also continue to leverage, where appropriate, research investments at NASA and DOD. The subcommittee would like a detailed update on FAA progress, plans, and relationships in this area at a future meeting.

Dr. Hansman suggested that the recommendation made by the subcommittee should focus on the research area need but not comment on monetary figures. Mr. McVenes concurred with the recommendation and will revise the recommendation to make it specific to the research need while being agnostic on funding.

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**Presentation:** Committee Closing Discussion, Future Actions

**Presenter(s):** *Dr. John Hansman*

Dr. Hansman concluded the meeting by summarizing emergent meta-themes from the REDAC discussion. He gained consensus with the group and summarized the following three main themes, while a fourth theme was suggested from a committee member.

- 1) Lack of flexibility to deal with emergent research issues due to the three year planning cycle.
- 2) There is agreement that the aviation R&D Landscape is a good development but the question remains how it will be used and how to gain consensus on its use. There needs to be some strategic guidance on the use of the aviation R&D Landscape (e.g., using it as a rubric).
- 3) The importance of sustainability was a key theme, particularly on the part of the manufacturers.
- 4) The rapid expansion of UAS is a challenge for the FAA and it is causing the FAA to be reactive as opposed to proactive.

**Research, Engineering and Development Advisory Committee  
Federal Aviation Administration (FAA)  
FAA Headquarters,  
800 Independence Avenue, SW, Washington, DC.  
MacCracken/Huerta Collab. Ctr. FOB 10A, 10<sup>th</sup> Floor  
October 10, 2019  
Agenda**

<b>Time</b>	<b>Topic</b>	<b>Presenter(s)</b>
9:00 am	Public Announcement and Welcome Chairman's Welcome Address	Shelley Yak John Hansman
9:15 am	FAA Opening Remarks	Carl Burleson
9:30 am	FAA Research and Development Landscape Update	Steve Summer
10:00 am	FAA UAS Update	Jay Merkle Sabrina Saunders- Hodge
10:30 am	<b>Break</b>	
10:45 am	Subcommittee Report – Environment and Energy	Ian Redhead
11:15 am	Subcommittee Report – NAS Operations	Leo Prusak
11:45 am	<b>Lunch</b>	
12:45 pm	Subcommittee Report – Airport	Chris Oswald
1:15 pm	Subcommittee Report – Human Factors	Barbara Holder
1:45 pm	Subcommittee Report – Aircraft Safety	Terry McVenes
2:15 pm	Committee Closing Discussion -Findings and Recommendations -Future Actions	John Hansman REDAC Members
3:00 pm	Chairperson's Closing Remarks	John Hansman

# Research, Engineering and Development Advisory Committee (REDAC) Summer/Fall 2019

Thursday, October 10, 2019

Name	Affiliation	Name	Affiliation
Mark Orr	FAA	Monique Moore	FAA
Maureen Molz	FAA	A. Grose	GAMA
Drez Zellweger	Consultant	Jay Merkle	FAA
Mark Hale	FAA/JMA	Sadaf Alam	FAA/A3 Tech
Hossein Eghbali	FAA	Nancy Clarke	FAA/JMA
Leo Prusak	PASSUR	Chinita Roundtree- Coleman	FAA
Michel Hovan	FAA	Terry King	FAA/CAMI
Barbara Holder	Honeywell		
Kerin Olson	FAA		
Michelle Yeh	FAA		
Deirdre Baker	FAA		
Ian A. Redhead	Kansas City International		
John Maffei	FAA ANG		
Pam Whitley	FAA ANG		
John R. Dermody	ANG ARP		
Thomas Cuddy	ANG ARP		
Mike Borowski	MITRE		
Bill Kaliadros	FAA ANG-C		
Christine Dejong	GAMA		
Julia Poonb	FAA AOV		
Tara Holmes	FAA ANG-C		
Latasha Monique Reddick	FAA		
Joe Bertapelle	JetBlue		
Jimmy Bruno	FAA		
Mike Gallivan	FAA		
Eric Neiderman	FAA		
Steve Summer	FAA		
Frank Wondolowski	FAA		
Sabrina Saunders-Hodge	FAA		
Paul Strande	FAA		
Daniel Brock	FAA		
Shelley Yak	FAA		
Philip Yeung	FAA		
Rich Golden	FAA		
Steve Alterman	CAA		
Chris Oswald	ACI-NA		
Greg Burke	FAA		
Terry McVene	RTCA		
William Oehlschlager	FAA		
Siroos Sekhavat	MITRE		