

**FEDERAL AVIATION ADMINISTRATION**  
**Research, Engineering and Development Advisory Committee**  
**Subcommittee on Aircraft Safety (SAS)**  
**2022 Spring Meeting Minutes**  
**March 1-2, 2022**

The 2022 Spring Research, Engineering and Development Advisory Committee (REDAC) Subcommittee on Aircraft Safety (SAS) meeting was held virtually on March 1-2, 2022. Attendee sign-in sheets are attached in Appendix I and the meeting agenda is attached in Appendix II. This document summarizes discussions and activities occurring during the meeting. The meeting resulted in three findings and six recommendations (F&Rs), which have been included as part of the official REDAC Chair's submission to the FAA. All presentation materials are available and can be downloaded through the FAA's REDAC website, i.e., <http://www.faa.gov/go/redac>.

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**Day 1 – March 1, 2022**

**Introduction/Opening**

The SAS Designated Federal Official (DFO) Mike Paglione, FAA William J. Hughes Technical Center Director Shelley Yak, and Subcommittee Chair Terry McVenes jointly kicked off the meeting with brief opening remarks. Paglione described purpose of the meeting, and Yak, provided opening remarks, including COVID-19 challenges, FAA's return to workplace, R&D Landscapes and the need for an R&D roadmap.

**SAS Chair Report on Full REDAC Meeting**

SAS Chair McVenes reported on the October 2021 full REDAC meeting. McVenes presented a summary of F&Rs from all Subcommittees from their last meeting. He summarized his cross-cutting observations during the full REDAC meeting as impressive amount of R&D completed during the pandemic, particularly on sustainable aviation fuel. He also introduced several candidates for SAS membership, i.e., Chris Dyer of Pratt and Whitney, Dan Diessner of Embry Riddle University, Greg Bowles of Joby Aviation, Bob Ireland of A4A, Lowell Foster of GAMA, and Steve Cook of Northrop Grumman.

**Review of August 2021 Meeting F&Rs**

Paglione and McVenes provided an overview of the August 2021 SAS meeting's F&R and the FAA's response to F&Rs. A focused session on Landscapes document use in the development of R&D portfolio was held as documented below.

**Briefing on Landscapes use in development of R&D portfolio (F&R action from August 2021 SAS meeting)**

Jon Schleifer of FAA's NextGen Office briefed attendees on using Landscapes for development of R&D portfolios. He mentioned that through an annually reoccurring process, the FAA team has identified a few gaps and opportunities, expanded the Landscape product and has been integrating the product into

process in an effort to optimize the R&D portfolio. The Research Executive Board (REB), which is comprised of FAA executives and senior researchers, use the Landscapes to optimize, balance, and prioritize R&D in existing strategic investments as well as emerging technologies.

### **Update on FY2024 research portfolio/revised process**

Mark Orr, FAA AVS R,E&D Manager, provided an update on the portfolio development process for FY24. Orr described the process and the Budget Line Item (BLI) team structures. FY24 planning improvements include: a focus on operational capabilities, outcomes, research questions, and research outputs; an emphasis on out-years with 5-year planning of projects within each BLI; and a focus on the project level as opposed to the program level. The draft FY24 portfolio includes 133 Project Proposals but 104 programmed within the allowed total target.

### **Review of FY2024 R&D portfolio (afternoon of Day 1)**

Ahead of the SAS meeting, the FAA submitted read-ahead materials, including the FY24 BLI Plans to the SAS members for review and comments. Each BLI plan included four parts: Part 1: BLI Definition and Scope; Part 2: Service/Office Research Requirements and Research Gap Analysis; Part 3: RE&D Management Team Programming/5-year Outlook; and Part 4: BLI Team Members. SAS members returned their comments in writing before Day 1 of the SAS meeting. In this session, Paglione and Orr led the review of the SAS members' comments on the individual FY24 BLI Plans and 5-Year Outlook for incorporation into the FY25 BLI Plan build. The FAA research sponsors answered SAS comments during the meeting. This session covered Fire and Safety Research; Propulsion and Fuel Systems (including Aircraft Catastrophic Failure); Advanced Materials/Structural Safety; Continued Airworthiness; Digital System Safety; Aircraft Icing; and Alternative Fuels for General Aviation.

### **Day 2 – March 2, 2022**

### **Review of FY2024 R&D portfolio (continued)**

Review of FY2024 R&D portfolio continued from Day 1. This session covered Aeromedical Research; Flight deck/Maintenance/System Integration Human Factors; System Safety Management/Terminal Area Safety; and Unmanned Aircraft Systems.

### **AFWERX Agility Prime and Dual-Use Aviation Technology**

Lieutenant Colonel Tom Meagher from the US Air Force provided a summary of AFWERX Agility Prime. AFWERX is a Technology Directorate of the Air Force Research Laboratory (AFRL) and the innovation arm of the Department of the Air Force. Meagher described the mission of AFWERX Agility Prime as "expanding technology transition paths to accelerate emerging dual-use markets by leveraging government resources for rapid and affordable fielding." To meet the mission, the strategy is to co-invest with industry to field a capability in 2-4 years. His presentation focused on Electric Vertical Takeoff and Landing (eVTOL) Aircraft. Meagher also described the Agility Prime analytics process.

## **Aviation Cybersecurity**

Dan Diessner of the Center for Aerospace Resilience at Embry-Riddle Aeronautical University provided a presentation on aviation cybersecurity and research needs. Diessner described formation of the Cyber Safety Commercial Aviation Team (CSCAT). The CSCAT is positioned to look into known cyber safety risk scenarios, execute a risk analysis study, and provide recommendations as appropriate. The CSCAT has identified the top three areas of greatest potential for cyber safety impacts in civil aviation if compromised. He briefly described the Aerospace Industry Association Civil Aviation Cybersecurity Subcommittee and its purpose. Diessner concluded that there is a need for a well-informed and balanced approach to maintain aviation cyber safety and cyber resilience as aviation becomes more interconnected.

## **FAA Budget Update**

Elizabeth Delarosby, Manager of R,E&D Financial Management, presented the FAA's FY22 R,E&D budget. Delarosby presented FY22 R,E&D budget Bill in the House, i.e., House language as well as the Senate language. The established target levels for FY24, FY25, FY26, FY27 and FY28 are \$267M, \$273M, \$279M, \$285M, and \$291M, respectively.

Delarosby mentioned that the current FAA Authorization signed by the President on Oct 5, 2018 extends the FAA authorization through 2023.

## **Physiological Monitoring of Aircrew for Prediction and Detection of Performance Impairment**

Dr. John Crowley of the US Army Aeromedical Research Laboratory (USAARL) briefed attendees on ongoing research in physiological monitoring of aircrew for Prediction and Detection of performance impairment. Dr. Crowley described USAARL historical contributions and its laboratories. He mentioned that there are numerous widely used wearables, such as smart watches and glasses for monitoring fitness and wellness. These wearable devices monitor humans for disease diagnosis, disease monitoring, physical fitness, and personal health. Similar devices could be used for physiological monitoring of aircrew for prediction and detection of performance impairment. Dr. Crowley described significant challenges that are yet to be resolved.

## **Insights in the AAM**

Greg Bowles of Joby Aviation briefed attendees on Joby Advanced Air Mobility capabilities. Bowles briefly described Joby's 5-seat vertical takeoff and landing aircraft characteristics and compared it with a compatible traditional aircraft. He provided usage statistics and how it fits into existing aviation operations rules.

## **Update on Boeing's perspective on aviation technology trends**

Brian Yutko of the Boeing Company briefed attendees on the future of Boeing technologies. Yutko mentioned several technologies, including digitization; artificial intelligence and autonomy; electrification; environment and sustainability; healthy travel; advanced materials and manufacturing; cyber security and quantum technologies; and increased access to airspace, are currently changing aerospace. He described Boeing R&D priorities in the context of these Technologies.

**Closeout Discussion**

Paglione and McVenes led the close-out discussion for the meeting. Attendees decided to hold the Summer/Fall meeting on August 1-2, 2022 at the FAA William J Hughes Technical Center.

## Appendix 1

### Attendee Sign-In Sheets (Day 1)

Yongzhe Tian (Yongzhe Tian)	Rich Golden	Dave Polland
Matthew Hollomon	Daniel Diessner	Curtis Davies
Kolie Lombard	John Crowley	Bill Kaliardos
Frank Wondolowski	Stafford Duncan	Huasheng Li
Jon Doyle	John Bakuckas	Kathy Abbott
Mike Paglione	Doug Rodzon	Tong Vu
Warren Underwood	Richard Lin	Rob Steinle
Todd Truitt	Aaron Van Buren	Rany Azzi
Holly Cyrus	Sohrob Mottaghi	Richard Ji
Jim Reynolds	Katrina Avers	Hailey Abaee
Stuart Scarangella	Carleen Houston	Lisa C Thomas
Jeff Warner	Kevin Stonaker	Robert Ireland
Hossein Eghbali	Cunping Huang	Michael Gorelik
Thomas Maloney	Tina Emami	William Oehlschlager
Jim Mangie	Shelley Yak	Stacey Hamilton
Yongzhe Tian (Yongzhe Tian)	Paul Tan	David W Brandt
Matthew Hollomon	Nick Lento	Ferne Friedman-Berg
Kolie Lombard	Edward Weinstein	Paul Strande
Frank Wondolowski	Steven Rehn	Thomas Van Dillen
Srini Mandalapu	Nick Lento	Tom Fournoy
Tanja M. Boehm	John Fisher	Mary A Schooley
John Miller	Charles J Enders	Dhaval Dadia
Steve Summer	Carla hackworth	Robert Ochs
Tara Gibson	Todd Lewis	Francisco Capristan
Mark Orr	Stephen Cook	Timothy G Smith
Julian Canizales	Ahmet Oztekin	Richard E Lyon
Dave Atwood	Jon Schleifer	James Reynolds
Larry McDonald	Robert J McGuire	Dan Dellmyer
Achal S Singhal	Don Kauffman	Cristina Tan
Ezgi	Chris Dyer	Edward Johnson
Traci Stadtmueller	Robert Sumwalt	Natallia Safronava
Robert Ellis	Caprice Brown	Danielle Stephens
Aeon S Brown	Barbara	Maria DiPasquantonio
Chinita Roundtree-Co	Rich Walters	Tara (Holmes) Gibson
Burak	Manny Rios	Larry Ilcewicz
Lakeesha Butler	Akbar Sultan	Matt Teyssier
Shane Bertish	Dan Brock	Ken Alexander
John Mixon	Lynn Pham	George Romanski
Greg Bowles	Chris Heck	Mark Rumizen
Terry McVenes	John Fisher	Stacey Zinke
Robert Ochs	Charles J Enders	Cody Nichols
Joseph Pellettiere	Cindy Ashforth	John Peace
Anthony Tvaryanas	Jorge Fernandez	Isidore Venetos
Katie Constant-Coup	Walt Sippel	Erin Sunshine
Vasudeva Kolli	Chuck Agava	Jeff Gardlin
Jason Coon	Eric Neiderman	Louise Speitel
Nancy Clarke	David Rathfelder	Dave Stanley
Stephanie DiVito	Mark Allen	Cliff Johnson

Monique Moore	Daniel Cordasco	Dave Stanley
Chris Dumont	Dave Galella	Ansel S James

### Attendee Sign-In Sheets (Day 2)

Warren Underwood	Robert Ellis	Somil Shah
Ferne Friedman-Berg	Dhaval Dadia	Francisco Capristan
Jeff Warner	Chris Heck	Mary A Schooley
Mike Paglione	Larry McDonald	Lakeesha Butler
Achal S Singhal	Larry McDonald	Jeff Gardlin
Hossein Eghbali	Katrina Avers	Lisa C Thomas
Cunping Huang	Edward Johnson	Nick Lento
Kevin Siragusa	Monique Moore	Shane Bertish
Holly Cyrus	Thomas Van Dillen	David W Brandt
Hailey Abaee	Rany Azzi	Robert Ireland
Kenneth Allendoerfer	Anthony Tvaryanas	Robert J McGuire
Mark Orr	Lynn Pham	Chuck Agava
Stacey Zinke	Victor Quach	Jon Schleifer
Timothy G Smith	Richard Lin	Tom Fournoy
Vasudeva Kolli	Caprice Brown	Tom Meagher
Robert Ochs	Stephen Cook	Charles J Enders
Alex Fu	Aeon S Brown	Cristina Tan
Dave Atwood	Rich Walters	Tanja M. Boehm
Paul Strande	Huasheng Li	Jason Coon
Jim Reynolds	Manny Rios	Curtis Davies
Cliff Johnson	Chris Dyer	George Romanski
Srini Mandalapu	Isidore Venetos	Cindy Ashforth
Matthew Hollomon	Don Kauffman	Ahmet Oztekin
Eddie Austrian	Akbar Sultan	John Peace
Steve Summer	Tina Emami	Anthony Long
Thomas Maloney	Dan Brock	Richard E Lyon
Chinita Roundtree-Co	Chris Dumont	Beth Delarosby
Jim Mangie	Mark Allen	Ezgi Oztekin
Aaron Van Buren	John Crowley	Dave Galella
Terry McVenes	John Bakuckas	David Rathfelder
Daniel Diessner	Bill Kaliardos	Ben Ivers
Stuart Scarangella	Tong Vu	Edward Weinstein
Carleen Houston	John Mixon	Ryan King
Stafford Duncan	Greg Bowles	Larry Ilcewicz
Frank Wondolowski	Rob Steinle	Ezgi Oztekin
Sohrob Mottaghi	Kathy Abbott	Brian Yutko
John Fisher	Katie Constant-Coup	Michael Gorelik
Kevin Stonaker (FAA)	Thomas Nesthus	Robert Ochs
Rich Golden	Erin Sunshine	Maggie Ma
Todd Lewis	Sabrina Saunders-Hodge	Louise Speitel
Dave Polland	William Oehlschlager	
Chuck Perala	Nancy Clarke	
Greg Bowles	Tara (Holmes) Gibson	

## 2022 Fall REDAC SAS Meeting

### Agenda

**March 1 – 2, 2022**

**Location:** Virtual meeting

**Zoom:** Click to Join:

<https://faavideo.zoomgov.com/j/1615829158>

• **Passcode: 701578**

**Phone Audio Only:**

• Call 1-888-924-3239; enter Meeting ID: 161 582 9158

• Passcode: 701578

<b>March 1 (Tuesday)</b>		
<b>Time</b>	<b>Topic</b>	<b>Presenter(s)</b>
0845 - 0900		Arrival to virtual meeting
0900 – 0915	Opening Remarks	Shelley Yak
0915 - 0930	Opening remarks/Purpose of the Meeting	Mike Paglione
0930 - 0945	SAS Chair Opening & Report on REDAC Meeting	Terry McVenes
0945 - 1000	SAS Membership discussion/ defining a good F&R	Mike Paglione/Terry McVenes
1000 - 1015	Comfort Break	
1015 - 1100	Overview of August 2021 F&Rs	Mike Paglione/Terry McVenes
1100 - 1130	F&R action – briefing on Landscapes use in the development of R&D portfolio	Jon D. Schleifer
1130 - 1200	Update on FY2024 research portfolio/revised process	Mark Orr
1200 - 1300	Lunch	
1300 - 1315	Introduction to the review of FY2024 portfolio	Mark Orr/ Mike Paglione
1315 - 1430	Domain: Aircraft Safety Assurance <ul style="list-style-type: none"> <li>• Fire and Safety Research</li> <li>• Propulsion and Fuel Systems (including Aircraft Catastrophic Failure)</li> <li>• Advanced Materials/Structural Safety</li> <li>• Continued Airworthiness (Structures)</li> <li>• Continued Airworthiness (Systems)</li> </ul>	Questions from SAS members
1430 - 1445	Comfort Break	
1445 - 1515	Domain: Digital Systems and Technologies <ul style="list-style-type: none"> <li>• Digital System Safety</li> </ul>	Questions from SAS members
1515 - 1600	Domain: Environment and Weather Impact Mitigation <ul style="list-style-type: none"> <li>• Aircraft Icing</li> <li>• Alternative Fuels for General Aviation</li> </ul>	Questions from SAS members
1600 - 1630	SAS F&R discussions and feedback (Day 1)	SAS members
1630 - 1645	First Day Review – Homework Assignments	Mike Paglione/Terry McVenes
1645	Adjourn	

## March 2 (Wednesday)

Time	Topic	Presenter(s)
0845 - 0900		Arrival to virtual meeting
0900 - 0930	Review of homework from first day	All
0930 - 1000	Domain: Human and Aeromedical Factors <ul style="list-style-type: none"> <li>Aeromedical Research</li> <li>Flight deck/Maintenance/System Integration Human Factors</li> </ul>	Questions from SAS members
1000 - 1030	Domain: Aviation Performance and Planning <ul style="list-style-type: none"> <li>System Safety Management/Terminal Area Safety</li> <li>Unmanned Aircraft Systems</li> </ul>	Questions from SAS members
1030 - 1045	Comfort Break	
1045 - 1130	AFWERX Agility Prime and Dual-Use Aviation Technology	Tom Meagher, Lt Col, USAF
1130 - 1200	Aviation Cybersecurity	Dan Diessner
1200 - 1300	Lunch Break	
1300 - 1330	FAA Budget Update	Beth Delarosby
1330 - 1430	Physiological Monitoring of Aircrew for Prediction and Detection of Performance Impairment	Dr. Crowley
1430 - 1500	Insights in the AAM	Greg Bowles
1500 - 1515	Comfort Break	
1515 - 1545	Update on Boeing's perspective on aviation technology trends	David Polland
1545 - 1615	SAS F&R discussions and feedback (Day 2)	SAS members
1615 - 1645	Closing remarks	Terry McVenes/ Mike Paglione /Mark Orr
1645	Adjourn	