Federal Aviation Administration

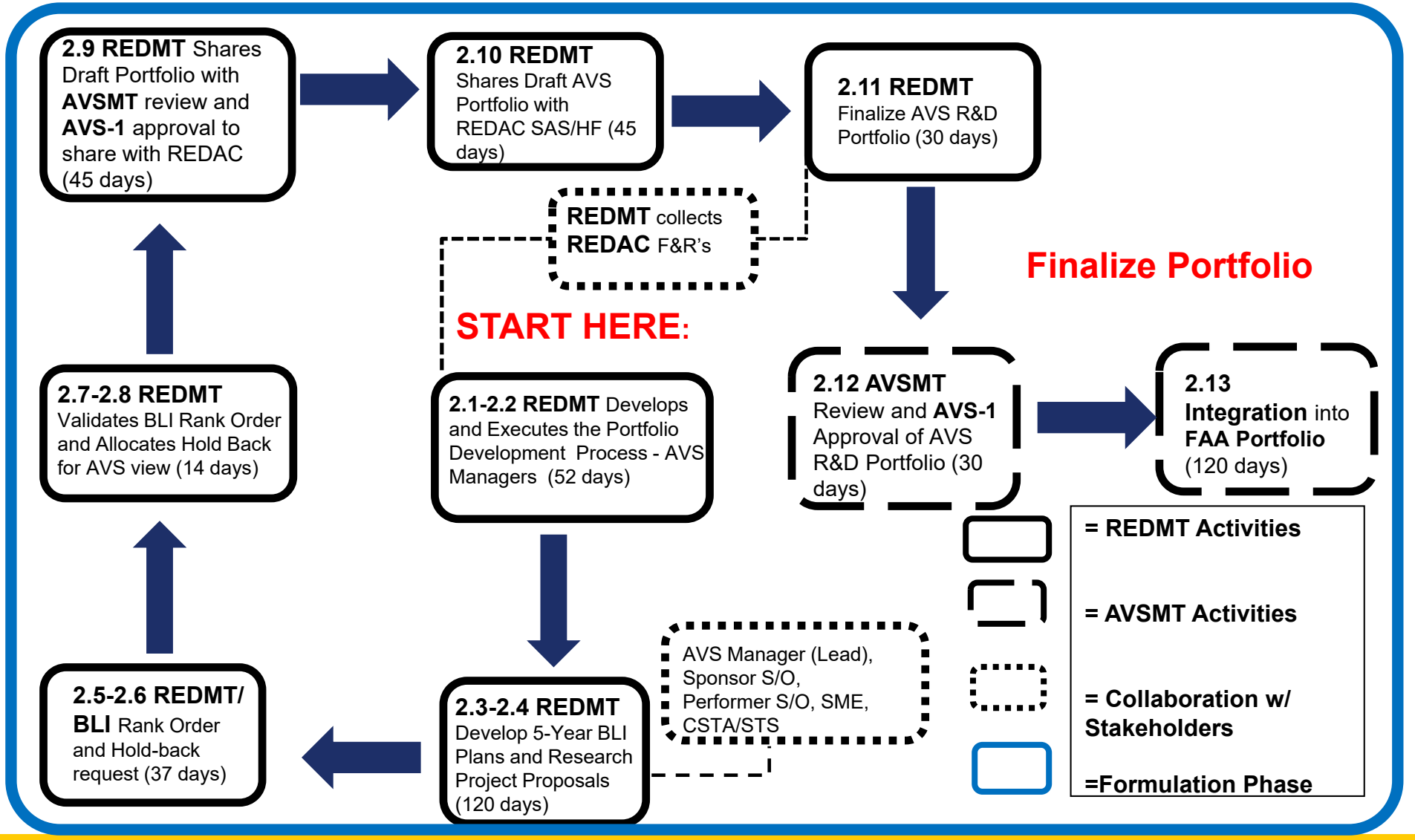
AVS Research, Engineering and Development

Update: 2024 Portfolio and Process

Presented to: REDAC SAS

Date: 3/1/22

FY24 AVS R&D Program/Process Overview



BLI Team Structure

BLI	Program Area	Research Sponsoring Service/Office* (*Bold indicates REDMT member BLI Team Lead*)	Research Execution Office (*Bold indicates the primary BLI fiduciary*)
A11A	Fire Research and Safety	**AIR**	**ANG-E2**
A11B	Propulsion and Fuel Systems	**AIR**	**ANG-E2**
A11C	Advanced Materials/Structural Safety	**AIR**	**ANG-E2**
A11DA	Aircraft Icing	**AIR**, AFX	**ANG-E2**
A11DS	Digital System Safety	**AIR**	**ANG-E2**
A11E	Continued Airworthiness	**AIR**	**ANG-E2**
A11G	Flightdeck/Maintenance/System Integration Human Factors	AIR, **AFX**, AAM, AVP	**ANG-C1**, AAM
A11H	System Safety Management/Terminal Area Safety	AIR, **AFX**, AOV, AVP	**ANG-E2**
A11J	Aeromedical Research	AIR, **AAM**, AFX	**AAM**
A11L	Unmanned Aircraft System Research	AIR, AFX, AAM, AOV, AVP, **AUS**	**ANG-C2**
A11M	Alt Fuels for GA	**AIR**	**ANG-E2**

***NOTE:** The S/Os listed are the ones that are CURRENTLY sponsoring research in each of these BLIs. In practice, any of the six AVS offices can sponsor research in any of these BLIs, and within the A11L BLI AUS acts as the AVS sponsor representing other FAA offices like APL.

FY24 BLI Team Planning Improvements

- S/O focused on Operational Capabilities, Outcomes, Research Questions, and Research Outputs

- Emphasized out-years with 5-year planning of projects within each BLI

- Focused on Project Level as opposed to Program Level

FY24 AVS RE&D BLI Plan Outline

- For REDAC SAS purposes, the BLI Plans are broken into 4 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
  - **Part 4:** BLI Team Members

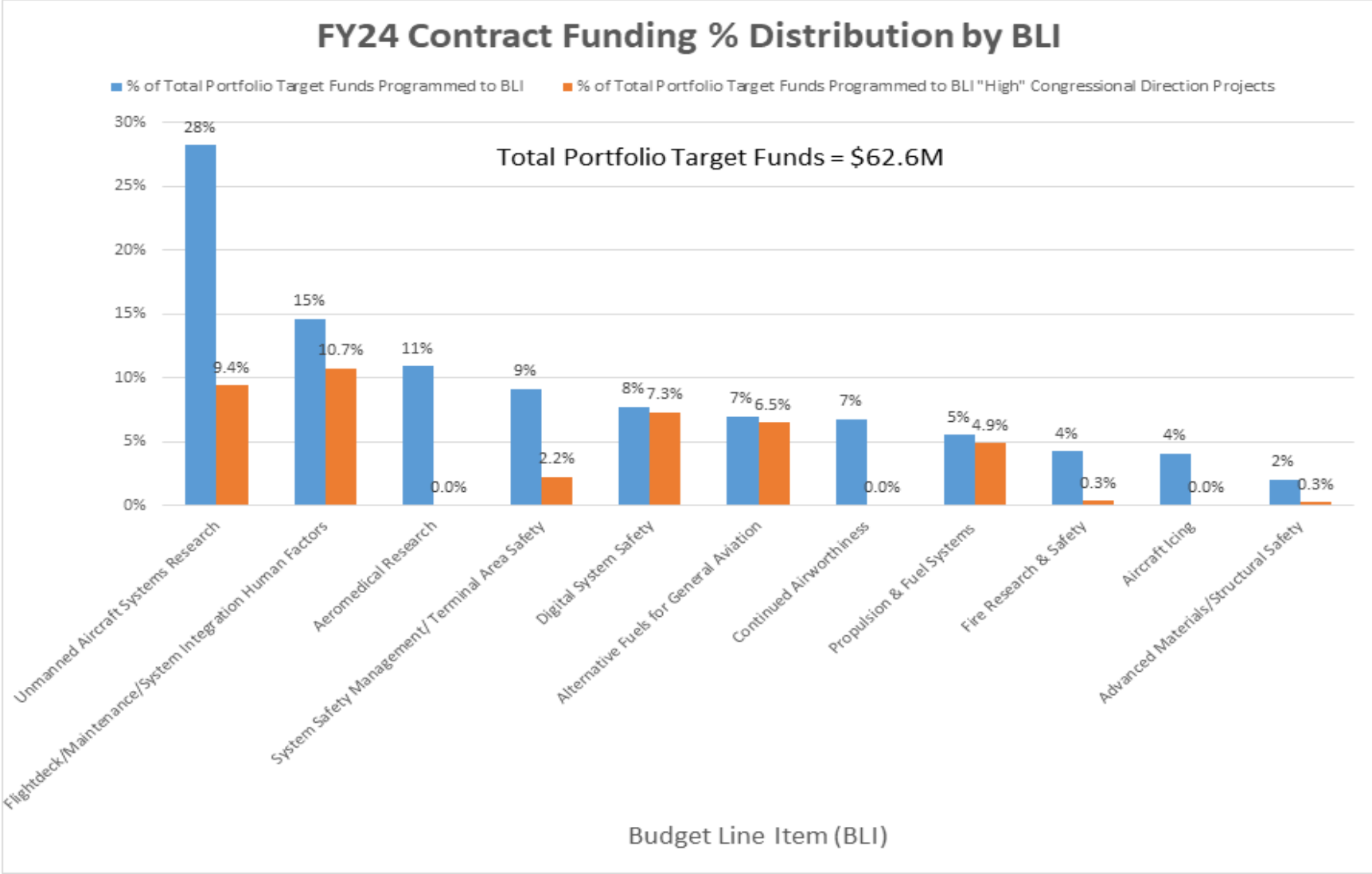
Draft FY24 Portfolio – Summary

- 133 Project Proposals
  - $83.3M cost estimates
  - $20.7M over the allowed target level

- 104 programmed within allowed total target (*$62.6M*)

- 24 Congressional Direction “High” rated proposals
  - All programmed to 100% of cost estimates
  - $26.0M total programmed
  - 41.5% of allowed total target

DRAFT FY24 Portfolio – BLI $ Distribution



Next Steps

- REDAC SAS
  - Provide feedback to BLI Plan for FY25 Portfolio Build

- FAA RE&D
  - Integrating the AVS RE&D FY24 Portfolio into the FAA Portfolio (March-June)
  - BLI Teams Update BLI Plans (February-April)
    - Validate OC's and Gap Analysis
    - S/O Executive Sign-off
    - Update Out-year Planning FY24-FY28
  - Kick-off FY25 Proposal Writing (April-July)

Back-Up Slides

FY24 BLI Plan: Part 1

Contains:

- BLI Scope
- Program and Domain Area

Part 1. BLI Definition and Scope

Program Area: Aeromedical Research (A11J)

FAA Domain: Human Performance and Aeromedical Factors

BLI Scope: Aeromedical Research

The Aeromedical Research program is scoped to focus on safety sensitive personnel and airline passenger health, safety, and performance in current and forecasted future civilian aerospace operations. It performs aerospace-relevant applied research in the biomedical, biodynamics and survivability/cabin safety sciences. This research culminates in the transition of knowledge and technology to enable innovation in aerospace operations and mitigation and prevention of aeromedical hazards associated with aerospace mishaps.

FY24 BLI Plan: Part 2

Contains:

- Operational Capability with S/O information
- Outcome
- Research Questions
- Contribution to realizing OC
- Research Output

Part 2: Service/Office Research Requirements and Research Gap Analysis

1.0 Operational Capability: Medical recertification of airmen with neurological and/or psychiatric conditions		
Definition: The ability to rapidly measure the adequacy of perceptual, cognitive, and information processing abilities associated with flying for use in the medical recertification evaluation of airmen with known or suspected neurological and/or psychiatric conditions.		
Primary Sponsor: Dr. Randy J. Georgemiller, AAM-204; Dr. David O'Brien, AAM-300 **Secondary Sponsor(s):** None		
S/O Priority: AAM#2		
Outcome: Airmen with newly diagnosed neurological and/or psychiatric conditions are being issued Special Issuances based on a cognitive test other than CogScreen-AE by 2025.		
Research Gap Analysis		
Research Questions	**Contribution**	**Research Output**
1.1 Do commercially available tests exist that reliably measure perceptual, cognitive, and information processing abilities associated with flying?	30%	• Literature review • Multi-attribute decision matrix for sponsor selection of 1-2 candidate commercial tests
1.2 What are the thresholds for minimally acceptable perceptual, cognitive, and information processing abilities for airmen by class of medical certificate?	70%	• Technical report summarizing normative data collection and recommended test thresholds • Normative dataset

FY24 BLI Plan: Part 3

Contains:

- 5-Year Outlook

BLI Plan 5 Year Outlook (FY22-27)

Complete (C)	In Progress (IP)	Programmed (P)	Need (N)

Research Activities	FY22	FY23	FY24	FY25	FY26	FY27
Operational Capability 1.0: Medical recertification of airmen with neurological and/or psychiatric conditions						
1.1 Do commercially available tests exist that reliably measure perceptual, cognitive, and information processing abilities associated with flying? (Control Account No: A11J.AM.12) [Completed in FY21]						
1.2 What are the thresholds for minimally acceptable perceptual, cognitive, and information processing abilities for airmen by class of medical certificate? (Control Account No: A11J.AM.12)	P	P	P			
Operational Capability 2.0: Performance-based medical recertification of airmen with chronic obstructive pulmonary disease						
2.1 What is the FEV1/FVC ratio that provides a 90% blood oxygen saturation level in airmen with chronic obstructive pulmonary disease at cabin pressures altitudes above 12,500 feet (MSL) up to and including 14,000 feet (MSL)? (Control Account No: A11J.AM.14)		P	N	N	N	
Operational Capability 3.0: Quantitative risk-based aeromedical certification						
3.1 How can a numerical estimate for aeromedical risk over a medical certification interval be calculated for an individual airman? (Control Account No: A11J.AM.16)	P	P	P			
3.2 How can an acceptable aeromedical risk threshold be determined based on overall system-level risk that considers technological mitigations?						

FY24 BLI Plan: Part 4

Contains:

- BLI Members
- Role/Org.

Part 4: BLI Team Members

Participants Name	Role	Routing Symbol
Baisden, Denise	Medical Clearances and Certification Sponsor	ASW-300
Copeland, Kyle	Numerical Sciences Research Performer Lead	AAM-631
Crane, Martin	Rotorcraft Sponsor	AIR-616
Deaderick, DK	Aviation Safety Inspector	AFS-220
DeJohn, Charles	Medical Research Performer Lead	AAM-631
DiPasquantonio, Maria	REDMT-AIR	AIR-600
Fernandez, Jorge	REDMT-AIR	AIR-600
Gardlin, Jeff	STS Aircraft Cabin Security and Survivability	AIR-600
Giovanetti, Penny	Medical Clearances and Certification Sponsor	AAM-200
Happenny, Stephen	Environmental Controls and Fire Protection Systems Sponsor	AIR-625
Hettman, Robert	AIR Sponsor	AIR-623
Jay, Susan	Aerospace Physiology Research Performer Lead	AAM-631
Lewis, Russell	Forensic Analyses Sponsor	AAM-610
Lennon, Shannon	Cabin Safety Sponsor	AIR-626
Moorcroft, David	Biodynamics Research Performer Lead	AAM-632
O'Brien, David	Medical Clearances and Certification Sponsor	AAM-300
Pellettiere, Joseph	CSTA Crash Dynamics	AIR-600
Rodzon, Douglas	REDMT-AFS	AFS-430
Stegeman, Robert	Technical Innovation Sponsor	AIR-621
Tvaryanas, Anthony	BLI Chair/REDMT-AAM	AAM-600
Uyhelji, Hilary	Functional Genomics Research Performer Lead	AAM-612