Strategic R&D Messaging Initiative

Presented to: Research Engineering Development Advisory Board (REDAC)

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Federal Aviation Administration

Briefing Purpose:

Discuss Strategic Outlook for Research (SOR) Charts

Intended Use of SOR Charts:

- Clearly communicate FAA's R&D plans to: senior management, REDAC, OST, House Science Committee, Congress staffers, Public, etc.

Benefit:

- Obtain buy-in, feedback and support

Research, Development, Test and Evaluation

Aircraft Safety Assurance

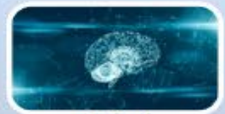
Fire Safety

Aircraft Structures

Propulsion & Fuel Systems

Digital Systems & Technologies

Digital Systems



Digital Technologies

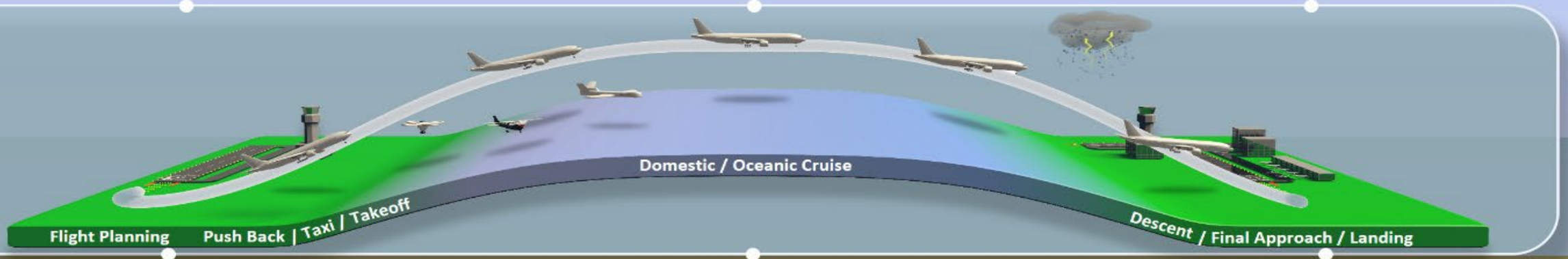
Cyber Security

Environmental & Weather Impact Mitigation

Weather

Icing

Environmental & Energy / Fuels



Airport Infrastructure & Technologies

Airport and Terminal

Pavement

Aerospace Performance & Planning

System Safety Management

Air Traffic Management

Emerging Operations

Human & Aeromedical Factors

Human Factors

Aeromedical Factors

Aircraft Safety Assurance

- Fire Research and Safety
- Advanced Material/Structural Safety
- Continued Airworthiness
- Propulsion and Fuel Systems *(including Aircraft Catastrophic Failure Prevention)*

Research required to ensure our certifications and inspection methods are informed for all aircraft components, material and designs throughout their operational lifecycle

FY 2023 Domain Priorities Overview

- Post Crash Fire Evacuation Related Issues
- Damage Tolerance for both Engine Life Limited Parts and Aircraft Structures
- Certification, Production, Maintenance and Inspection for Advanced Materials & Manufacturing Methods
- Existing & Advanced Structural Inspection/Monitoring Technologies
- Integrated Flight and Propulsion Controls
- Novel, Unusual, and Large Electric Aircraft Systems

Need for Change

FACT: FAA’s yearly messaging is repetitive

Perception:

- FAA’s research doesn't end or conclude
- FAA’s research is not completed in a timely manner to have an impact
- FAA’s research does not keep pace with technology trends and industry needs

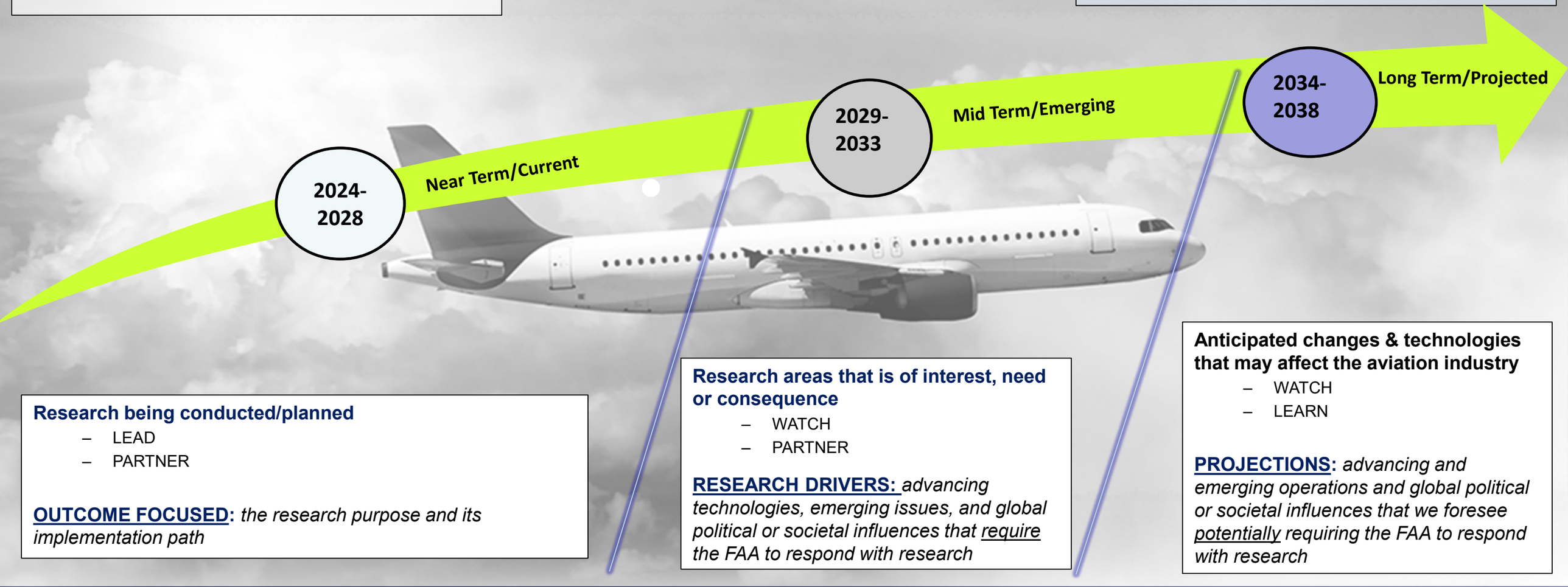
Need: Share and facilitate discussion on FAA’s R&D portfolio/strategy:

- What FAA’s R&D results will be used for (expected outcomes)
- What is happening in industry and FAA’s R&D plans/response
- The need/requirement for research (projections and research drivers)

Strategic Outlook for Research in "DOMAIN AREA"

- **Budget Line Items represented**

Purpose for research



Research being conducted/planned

- LEAD
- PARTNER

OUTCOME FOCUSED: *the research purpose and its implementation path*

Research areas that is of interest, need or consequence

- WATCH
- PARTNER

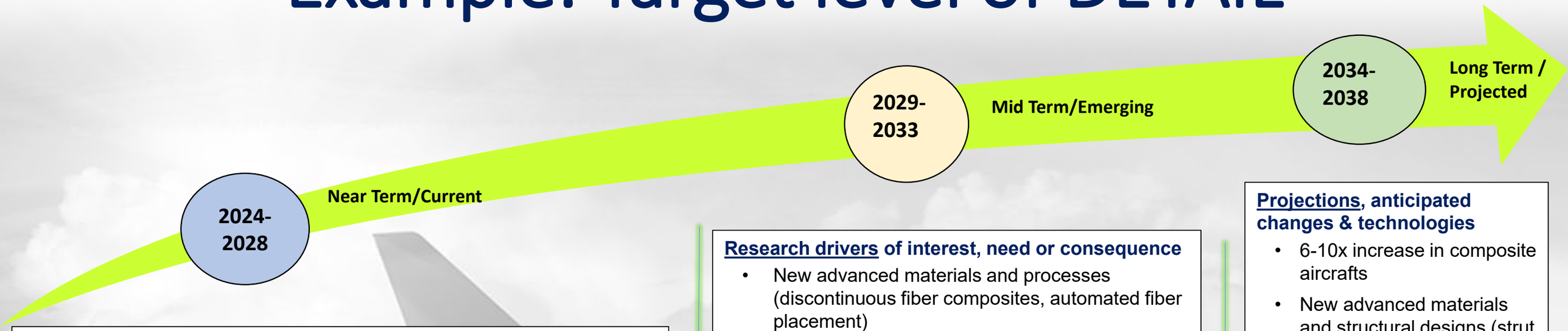
RESEARCH DRIVERS: *advancing technologies, emerging issues, and global political or societal influences that require the FAA to respond with research*

Anticipated changes & technologies that may affect the aviation industry

- WATCH
- LEARN

PROJECTIONS: *advancing and emerging operations and global political or societal influences that we foresee potentially requiring the FAA to respond with research*

Example: Target level of DETAIL



Research supporting standards and guidance development for:

- Composite structural technologies for eVTOL/fixed wing aircraft
- Aging mechanisms for composites
- Develop standardized qualification protocols for emerging composite materials, additive manufacturing, and other advanced materials and fabrication technologies.
- Manufacturing control and inspection methods including in-situ monitoring and non-destructive inspection for new advanced materials
- Certification of new eVTOL and AAM structural designs

Research drivers of interest, need or consequence

- New advanced materials and processes (discontinuous fiber composites, automated fiber placement)
- NASA's High Rate Composite Aircraft Manufacturing (HiCAM) project and Material Genome Initiative.
- Composites seats on eVTOL, AAM, and traditional aircraft
- Aging and fatigue behavior of AM materials (especially for new eVTOL/AAM applications)
- End-of-life performance issues of new advanced materials and possibility of recycling.

Projections, anticipated changes & technologies

- 6-10x increase in composite aircrafts
- New advanced materials and structural designs (strut braced wing, blended wing body, morphing wing).
- Dynamic behavior related issues of new materials


Questions