Aviation Safety Research Strategy

Full REDAC Meeting

October 16, 2024

Federal Aviation Administration

Aviation Safety Strategy

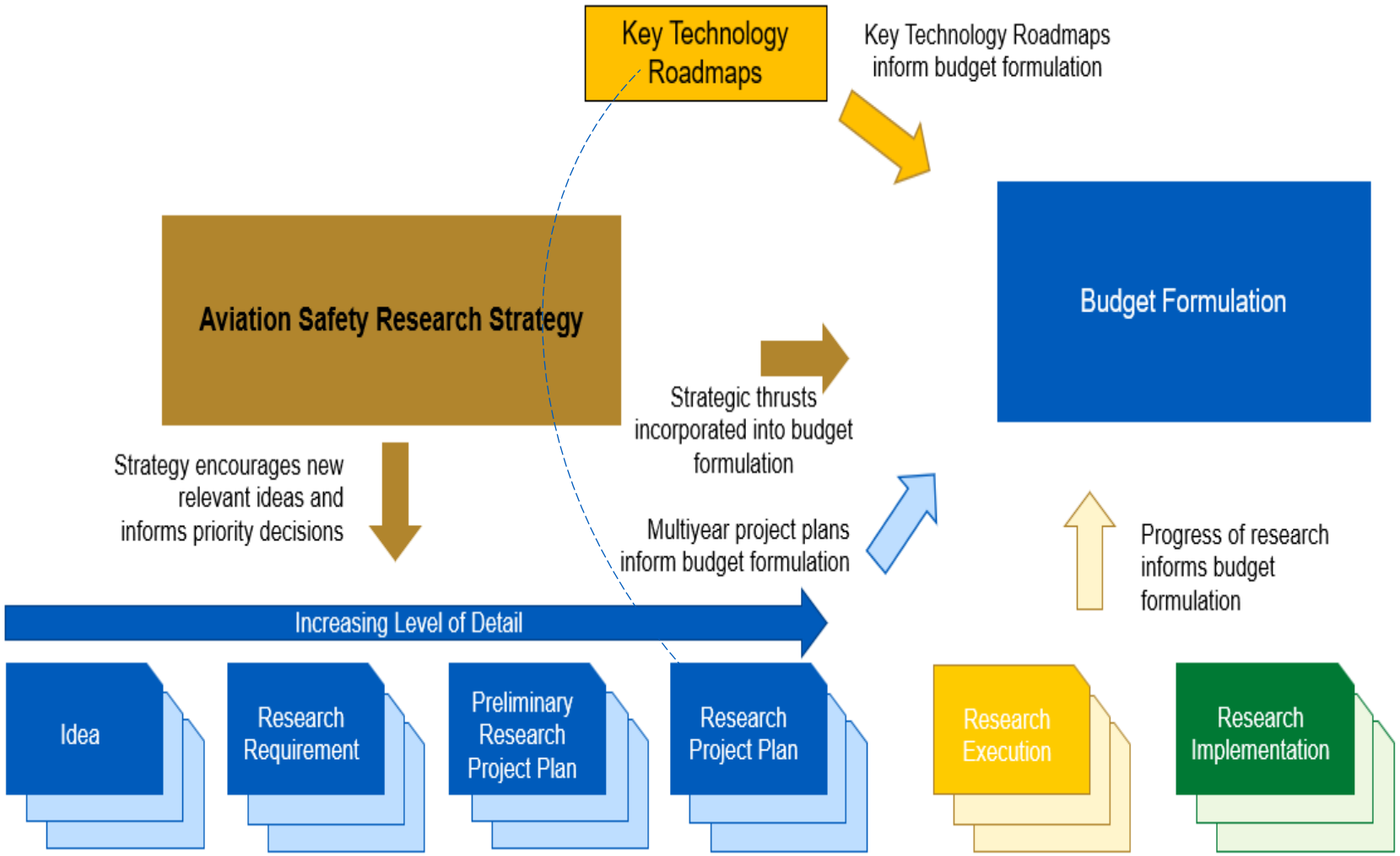
Why are we Doing This?

- Establish research goals and gain support from industry & other USG agencies
- Guide FAA investments in internal (people/labs) and external research
- Influence research ideation in priority areas
- Inform future research appropriations and other research
- Inform and leverage research plans of NASA, other USG, industry and academia

Common Misconceptions

- The strategic thrusts focus on FAA-sponsored research
  - Reality: Aviation safety is a shared responsibility with industry, and we aim to influence their research
- The strategic thrusts should lead to program plans and specific deliverables
  - Reality: The thrust provide direction and acceleration – in many cases the destination is unknown
- All FAA research that is important should be connected to a strategic thrust
  - Reality: There are and will continue to be other priorities

Overview of Relationships



- Research Strategy – Captures the breadth of major challenges and opportunities as they relate to safety of aviation.
  - Strategic Thrust – Longer-term themes that provide direction and acceleration.
- Key Technology Roadmap – Defines a path for the safe introduction of emerging technology in aviation
- Research Project Plan - These documents describe (1) research activities, outputs, schedules, and resources, (2) sponsor implementation activities, outputs, and schedules, and (3) safety outcomes.

REDAC Tasking – April 2024

- Review the draft strategy and advise on updating the document
  - Are there missing research thrusts?
  - Are there thrusts that are not critical?
  - Recommendations to the vision, objectives, strategy and schedule for each thrust?
  - Identify opportunities to leverage industry research

- Conduct Strategy Workshop to gather additional feedback.

- Complete REDAC review, to adopt any appropriate recommendations

- FAA will update Strategy based on REDAC feedback and publish initial version by end-of-year 2024

Is AVS/AIR moving in the right direction?

Strategic Thrusts

Safety of the System Research Bundle

Operational Safety: Identified safety risks for U.S. aircraft and operations in U.S.-controlled airspace are mitigated to acceptable levels.

Safety Analytics and Risk Synthesis: Potential safety risks are identified before they manifest as risks and are evaluated in the context of the aviation system.

Public Health Preparedness: Prepare the aviation transportation sector to be resilient in the face of new or re-emerging infectious disease.

Cybersecurity: Assure that aircraft operations are safe in the face of evolving cybersecurity threats through holistic methods for protection, detection, response, and recovery.

Certification Research Bundle

Emerging Entrants: Enable the safe introduction of drones and advanced air mobility.

Sustainable Flight: Normalize the safety requirements and compliance for technologies and operations for sustainable aviation.

Artificial Intelligence: Develop methods to assure the safety of AI and identify methods to use AI for safety.

Structure, Materials and Manufacturing: Establish effective and timely safety standards for introduction of new materials, structures, and manufacturing techniques.

Strategic Thrusts (cont.)

Improvement Research Bundle

Increasing Automation and Complexity: Assure the safety of increasingly complex automation and human interaction.

Future of Oversight: The FAA continuously improves the effectiveness of oversight to ensure the aviation system meets public expectations.

Feedback/Workshop Objectives

Written Feedback Objectives (May-June 2024)

- Are there important safety research themes that are missing?
- What topics would you like to see addressed?
- What research thrusts would you propose to delete, and why?
- What ideas are missing, or with which you disagree? Why?
- Provide any industry or other government research that is relevant to the thrust and could affect the objectives, strategy and schedule?

Workshop Objectives (August 2024)

- Discuss common themes from feedback and get clarification across research bundles.
- Define set of actions to gain REDAC endorsement

Confirming AVS/AIR is moving in right direction

Updated Strategy

Most of the written and verbal workshop feedback was at a detail level more applicable to the Key Technology Roadmap and or Research Project Plans.

Updated Strategy

- Define scope to AVS/AIR responsibilities.
- Innovation research motivator/bundle removed.
- Reduced thrusts to 10 (distributed Digital Engineering across thrusts).
- Incorporated a Cybersecurity Thrust
- Human Factors considerations have been integrated across the thrusts.
- Expanded Safety Continuum discussion throughout document.
- Enhanced crosswalk/inter-dependency discussion within thrusts.
- Integrated workshop research ideas into thrust schedule objectives.
- Strengthening relationship between NARP and Aviation Safety Research Strategy.

Closing

- Developed Aviation Safety Research Strategy to define direction and acceleration.
- Engaged REDAC (written feedback and workshop) to gather Industry perspectives.
- We are building a stronger alignment between NARP SOAR charts and Strategic Thrusts.
- Updated Aviation Safety Research Strategy to publish initial version by end-of-year 2024 .

AVS/AIR moving in the right direction?