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Agenda Item 3: **Second GREPECAS-RASG-PA Joint Meeting**
3.2 CAR/SAM Regions Air Navigation Priorities, Targets and Emerging Risks

THE UNITED STATES FEDERAL AVIATION ADMINISTRATION ADVANCED AIR MOBILITY ACTIVITIES

(Presented by the United States)

EXECUTIVE SUMMARY

This paper presents information about the United States (U.S.) Federal Aviation Administration (FAA) Advanced Air Mobility (AAM) integration activities. The advent of new and emerging technologies such as electric vertical take-off and landing (eVTOL) aircraft and automation have evolved into broader concepts for AAM. Innovation is a strategic priority for the FAA and the U.S. Department of Transportation (DOT), and the FAA's continuing mission to provide the safest, most efficient aerospace system in the world supports this priority. The global aviation community must take incremental steps to best enable these advanced concepts. All stakeholders must work closely together to safely and efficiently integrate these new aviation technologies into the existing system, and thereby turn new and innovative concepts into long-lasting benefits.

Strategic Objectives:	• Safety • Air Navigation Capacity and Efficiency • Environmental Protection

1. Introduction

1.1 The U.S. DOT and the FAA have made enabling innovation a priority. The advent of new and emerging technologies, such as eVTOL aircraft, along with automation technology, have now evolved into broader concepts for AAM. The FAA is working across the Agency on the safe integration of AAM into the U.S. National Airspace System (NAS). AAM is not a single technology, but rather a collection of new and emerging technologies being applied to the aviation ecosystem, particularly in new aircraft types.

1.2 AAM aircraft present several unique challenges for integration into the existing airspace system and the FAA is moving quickly to keep up with the fast-changing environment. To safely enable these advanced concepts, we must take action. Near-term operations will be piloted, type certificated eVTOL/VTOL aircraft, operating in currently defined airspace. The FAA is engaged in rulemaking to further enable AAM operations and expects to use waivers, deviations, and exemptions as needed for initial operations. The FAA expects to certificate the first AAM aircraft in late 2024.

2. Discussion

2.1 Currently, regulatory gaps are being identified by FAA lines of business (LOB) and staff offices and implementing processes are in place to bridge them. These processes should align with any future rulemaking that may be required.

2.2 Some of the biggest challenges are establishing safety and capabilities for AAM aircraft, ensuring sufficient infrastructure exists to safely integrate AAM aircraft into the air traffic management system, addressing cybersecurity issues, and determining how these new aircraft will impact airspace capacity.

2.3 Early engagement with FAA and industry applicants is essential in identifying an approach that supports the safe integration of these aircraft and operational concepts in the existing airspace. Industry will be the leading factor driving innovation and the prioritization of FAA resources and activities. The FAA, through these partnerships, needs to provide guidance in addressing aircraft certification, aircraft maintenance, pilot certification, vertiport standards, operational requirements, and regulatory leadership.

2.4 The FAA's Center for Emerging Concepts and Innovation (CECI) facilitates Early Innovation Engagement (EIE) with applicants to develop a clear path to aircraft type certification. The Aircraft Certification Intake Board identifies the projects that will require EIE engagement. CECI is actively supporting several AAM applicants in the early identification of means of compliance developing a pathway to certification and operational approval.

2.5 In the near term, the FAA plans to type certificate powered-lift AAM aircraft under its "special class" process in Title 14 of the U.S. Code of Federal Regulations (14 CFR) part 21.17(b) designation of applicable regulations, using portions of the performance-based airworthiness standards contained in the 14 CFR part 23 regulations for small airplanes. This "special class" process is designed to address the many novel features of unique aircraft such as these emerging powered-lift designs. This regulatory framework already exists, and this approach is consistent with international standards.

2.6 In the long term, the FAA plans continued development of powered-lift regulations safely enabling innovation with regard to powered-lift operations and flight training.

2.7 FAA is also working with industry applicants to identify appropriate environmental certification requirements for these AAM aircraft. Additionally, FAA is supporting research on the potential environmental benefits of AAM aircraft and their operations.

2.8 The FAA's aviation safety agreements with regulatory partners covers innovative projects such as eVTOL aircraft. The FAA is working with foreign regulatory counterparts validating their eVTOL aircraft under development, and developing a path for U.S. eVTOL/VTOL aircraft to be validated by them.

2.9 The ICAO Personnel Training and Licensing Panel is tasked with developing pilot licensing standards for electric aircraft, including eVTOL aircraft. The impacts on aviation maintenance training and air traffic controller training are also being considered.

2.10 The initial near-term AAM airspace operations will utilize existing Visual Flight Rules (VFR) procedures in the NAS. This plan proposes the use of a combination of waivers, Letters of Agreement (LOAs), and updates to air traffic procedures to enable AAM VTOL operations.

2.11 The FAA's current regulatory framework, with minor updates, will support industry's efforts to achieve near-term AAM operations.

2.12 Many manufacturers have messaged longer term strategies to conduct remotely piloted or autonomous operations. As these concepts are developed and the technology matures, the FAA will continue to evaluate the impact to the U.S. NAS and its regulatory framework so it, too can evolve to support safe integration.

2.13 While some AAM operators appear to be positioning themselves to use existing infrastructure, new infrastructure and facilities may also be a path forward for near-term AAM operations. The FAA is developing a new vertiport Advisory Circular (AC) which will provide guidance on vertiport design. This AC is expected to be published during or after 2024.

2.14 The FAA recently published a draft Engineering Brief on vertiport design to provide interim guidance related to ground infrastructure development. It is critical that AAM aircraft manufacturers specifically share flight characteristics and aircraft performance data with global regulators as their designs and aircraft mature. This information is needed for regulators to develop performance-based standards for vertiports.

2.15 Stakeholder engagement is an essential element in collaborative decision-making and developing programs s for lasting success. Stakeholder engagement includes outreach to industry and the general public, including coordination with elected officials at all levels of government, including federal, state, local, tribal and territorial governments and law enforcement stakeholders.

2.16 Near-term AAM operations will set the stage for widespread community awareness. As the industry matures, regulators, operators, and industry will need to help promote community engagement. As we learn about the technology and the safety measures that are taken to make the operations safe, regulators should work with stakeholders to provide information necessary to inform the public about these new applications.

2.17 The FAA is also collaborating with the U.S. National Aeronautics and Space Administration on an AAM research framework and through AAM working groups. The primary objective is to share inputs, information, and data that may help accelerate the development of safe, high- volume AAM operations in the existing and anticipated future airspace system. The research findings, along with the FAA's current efforts to enable near-term operations, will serve to inform future decisions and rulemaking requirements as the AAM industry matures.

3. Conclusion

3.1 Near-term operations in the United States will be piloted operations utilizing type certificated VTOL aircraft that operate in currently defined airspace. The FAA will leverage regulatory tools (e.g., rulemaking, waivers, deviations, and exemptions), enabling the industry's proposed future operations, where regulations do not contemplate or adequately cover AAM operations. As the AAM industry continues to evolve and we learn from initial operations, additional rulemaking will likely become necessary to fully integrate. There will be a need to develop and implement new regulatory criteria and guidance material for all AAM stakeholders, where existing criteria and guidance are inadequate or non-

existent. The FAA and industry will work together within their respective roles: industry as the innovator and FAA as the regulator, to support the necessary rulemaking where appropriate.

3.2 The FAA has a long, successful history of safely and efficiently bringing new and emerging technologies into aviation. The FAA is committed to safely integrating these highly automated, and what many envision to be autonomous, aircraft into our system in accordance with FAA safety standards. We look forward to continued collaboration with regulators and the AAM community around the globe. There is much work to do to move toward AAM integration and we will need a broad collection of voices at the table, including those of our global partners.

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