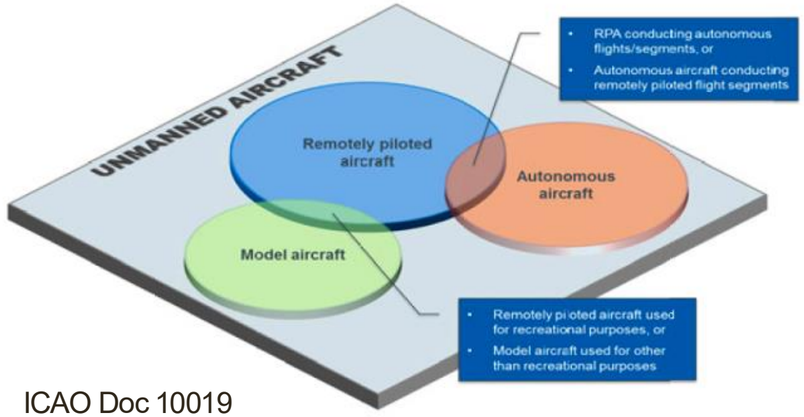
DIRECTORATE GENERAL OF CIVIL AVIATION
INDONESIA

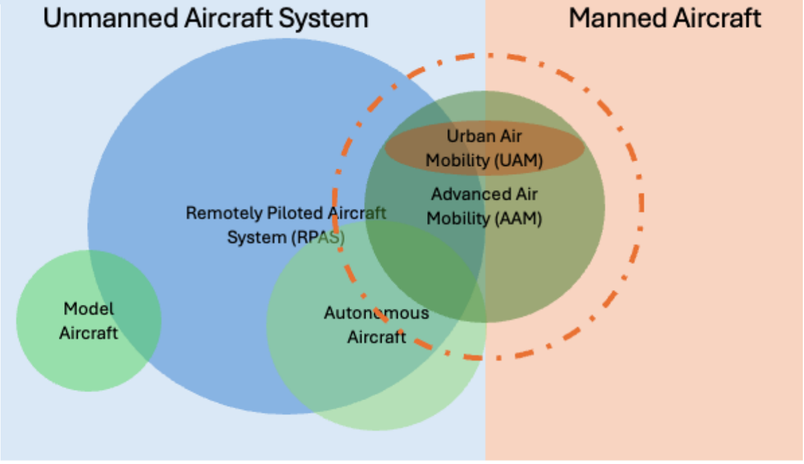
SKIES OF TOMORROW: INDONESIA'S JOURNEY WITH UAS/RPAS & AAM

"What are Advanced Air Mobility (AAM) and Urban Air Mobility (UAM) look like???"

All unmanned aerial vehicle images are referred to as AAM (Advanced Air Mobility)
If AAM is used in urban areas/cities, it is referred to as UAM (Urban Air Mobility) as marked with a red box.



ICAO Doc 10019



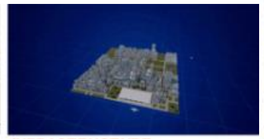
NASA's Advanced Air Mobility Work


EMERGENCY RESPONSE


HEALTHCARE


AUTOMATION


NOISE


INFRASTRUCTURE


VERTIPORTS


TRAVEL TIME


FUTURE AIRSPACE


SAFETY


ACCESSIBILITY

The Mission

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- DGCA Indonesia is in process to integrate Unmanned Aircraft System (UAS) and Advanced Air Mobility (AAM) into the nation's aviation airspace. This initiative aims to revolutionize urban transportation and logistics through innovative aircraft technologies.

- Trying to capture the best approach to adapt existing regulations for AAM (eVTOL) aircraft and operations

- Considering to develop Performance and Risk Based Approach regulations

Stakeholders Mapping

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Ministry of Defense / Airforce
- National Defense and Security
- Security Clearance
- Coordination for Proibited/Restricted Area

AirNav Indonesia (ANSP)
- Airspace reservation
- Safety Risk Assessment
- Coordination for drone/AAM operation (Notam)

National Police
- Security for drone operation
- Law Enforcement

Manufacture
(PT. Dirgantara Indonesia, PT. LEN, PT. Iter Aero, PT. Vela Prima)
- National drone/AAM industry
- Drone/AAM manufacturing
- Drone/AAM trial

Ministry of Communication & Digital
- Frequency Allocation
- Certification for drone/AAM as Telecommunication Facility

Ministry of Transportation
(Directorate General of Civil Aviation)
- Policy and regulation for drone/AAM operation based on civil avition rules
- Providing drone/AAM roadmap
- Certification. Licensing, operation authorization for drone/AAM
- Providing UTM

(Transportation Policies Agency)
- Drone/AAM studies

Operator
(Prestisius, Terra Drone, Halo Robotic, etc)
- Drone/AAM Operation
- Drone/AAM commerce

Ministry of Industry
- Development of local drone/AAM industry

Ministry of Trade
- Trading foreign drone in Indonesia

Community
(APDI, FASI, ASTTA, etc)
- New technology
- Community development
- Public engagement (public trust)

National Research and Innovation Agency
- Research for drone/AAM development
- Innovation for new drone/AAM technology

Academia
(University)
- Research & Study

Framework of roadmap development in Indonesia

Steps in Developing Roadmap

1. Establish Task Force
2. Mapping Needs and Challenges
3. Consultation and Collaboration
4. Goal and Objective Setting
5. Identification of Action Steps
6. Development of Work Plan
7. Testing and Evaluation
8. Commitment, Iteration and Updates

Short Term 2024 - 2026

- Establishment of Unmanned Aircraft Working Group,
- Regulatory Renewal,
- Human Resource Development,
- Pilot Testing – Pilot Project,
- Participation in International Activities/Working Groups,
- Promotion/Safety Campaign, and Socialization
- Establishment of Sandbox – Pilot Project
- Planning of UAS Traffic Management (UTM)

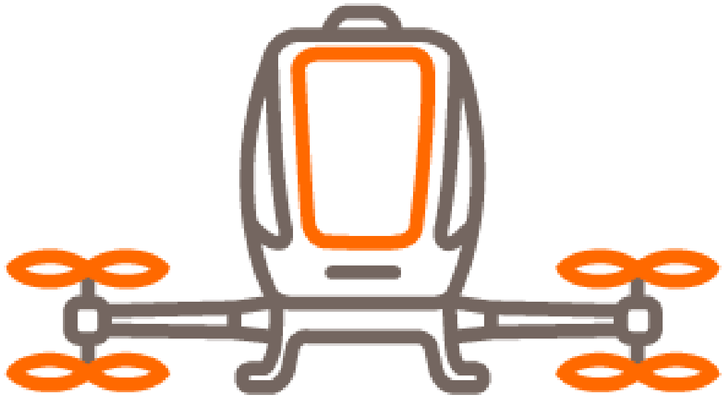
Middle Term 2026 - 2030

- Implementation of new regulations,
- Evaluation of Pilot Testing – Pilot Project,
- Infrastructure Development,
- Partnership with Industry and Academia,
- Development and certification of local industry (TKDN),
- Strengthening supervision and security,
- Promotion and Socialization
- Evaluation and replication of Sandbox
- Establishment of UAS Traffic Management (UTM)

Long Term 2030 - 2045

- Implementation of transportation system integration;
- Implementation of UTM Ecosystems
- Active role in the international arena,
- Innovation and development of technology ecosystems

UTM



1 **Already Have**

2 On Going Proces

3 What Next?

Indonesia Regulation for UAS/RPAS

DIRECTORATE GENERAL OF CIVIL AVIATION

➢ **AVIATION LAW NO. 1 YEAR 2009**
➢ **Government Regulation (PP No. 32 Year 2021) concerning Aviation**

➢ **PM 37/2020** UAS Operations in Indonesia Airspace

International Reference

AAM-WG
Advanced Air Mobility Working Group

UCWG
Unmanned Aircraft Certification Working Group

Joint Authorities for Rulemaking on Unmanned System

≤25kg

- PM 63/2021 **(CASR 107 Amdt. 1)** Small UAS
- KP 242 Tahun 2019 **(SI 8900-12.01)** Small UAS regsitration
- **PR 9 Tahun 2022** Technical Instruction for UAS Operations with an information technology based system

>25kg

- PM 98/2015 **(CASR 21)** Certification Procedures for Product and Parts
- PM 34/2021 **(CASR 22)** Airworthiness Standard for RPAS
- PM 33/2022 **(CASR 119)** Aircraft Operation Certification for Air Transport
- PM 26/2021 **(CASR 47)** Aircraft Registration
- PM 81/2017 **(CASR 91)** General Operating and Flight Rules
- PM 63/2017 **(CASR 135)** Certification and Operating Requirements for Commuter and Charter Certificate Holders

UAS/RPAS Categorization in Indonesia

DIRECTORATE GENERAL OF CIVIL AVIATION

CASR 107

25 Kg /
55 lbs.

Remote Pilot Certificate / RPC (Online Registration)	**REMOTE PILOT**	Remote Pilot License
Small UAS (8 digits) Online Registration	**REGISTRATION**	Aircraft Registration
• Registered Operator (RPC) • For Air Transport: ROC	**ORGANIZATION**	Remote Pilot Operator Certificate (ROC)
Not Applicable	**DESIGN CRITERIA**	Airworthiness Standard, Special Condition, others

AIRSPACE

- Priority using segregated airspace, VLOS, Daylight, unpopulated
- BVLOS, Cargo, Night, Multi drone Operations need Operation Safety Risk Assessment

• Hobbies/Recreational (Max 7kg, community based) • Basic Operation • Extend basic: SORA	**OPERATION AUTHORIZATION** Period time, altitude, specific area operation, based on risk assessment	Restricted Category, Special Operation

UAS/RPAS Operation in Indonesia

DIRECTORATE GENERAL OF CIVIL AVIATION

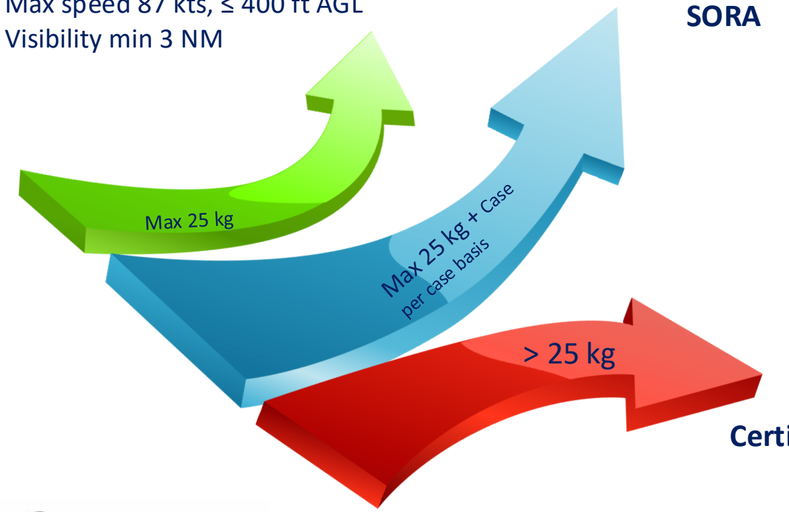
UAS/RPAS operation authorizations are granted to operators, according to Minister of Transportation Regulation number PM 37 Year 2020

ICAO State Letter AN 3/5.12-21/20 dated 31 Mar 2021 (Adoption of **Amendment 108 to Annex 8)**

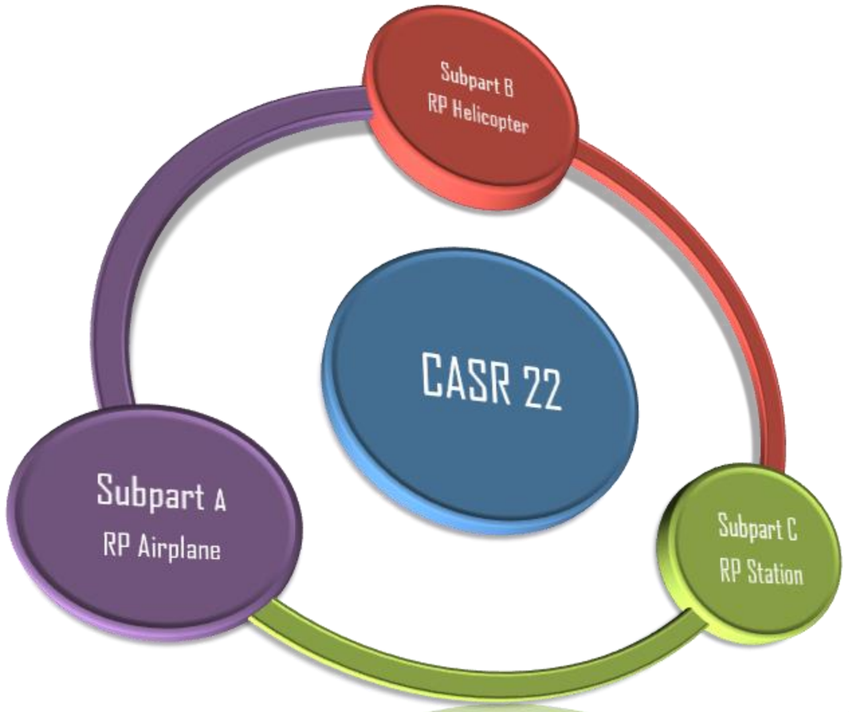
Basic Operation Limitations (CASR 107)

- Not operate from moving vehicle
- Daylight only
- VLOS only
- Multi-drone operation is not allowed
- Do not over people (unless direct participant)
- Do not bring dangerous goods
- Max speed 87 kts, ≤ 400 ft AGL
- Visibility min 3 NM

Expand Basic Ops using SORA



Certified UAS



CASR 22 Airworthiness Standard for RPAS

- Flight
- Structure
- Design & Construction
- Powerplant
- System & Equipment
- Operating Limitation & Information
- Environment & Human Factor
- Remote Pilot Integration
- Remotely Piloted Unique Considerations
- Remote Pilot Crew Compartment Safety
- RPS Security

UAS Online System / SidopiGo

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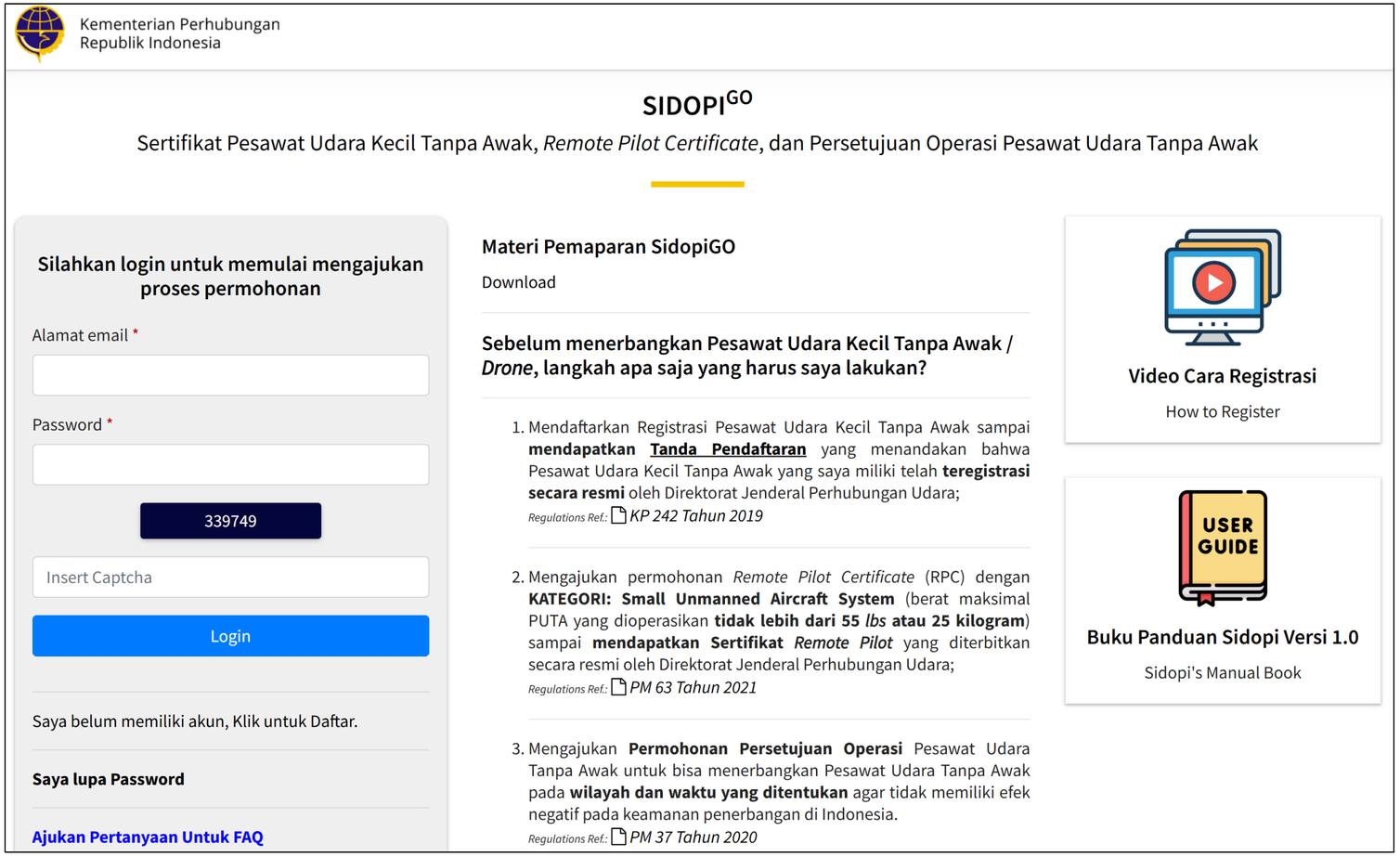
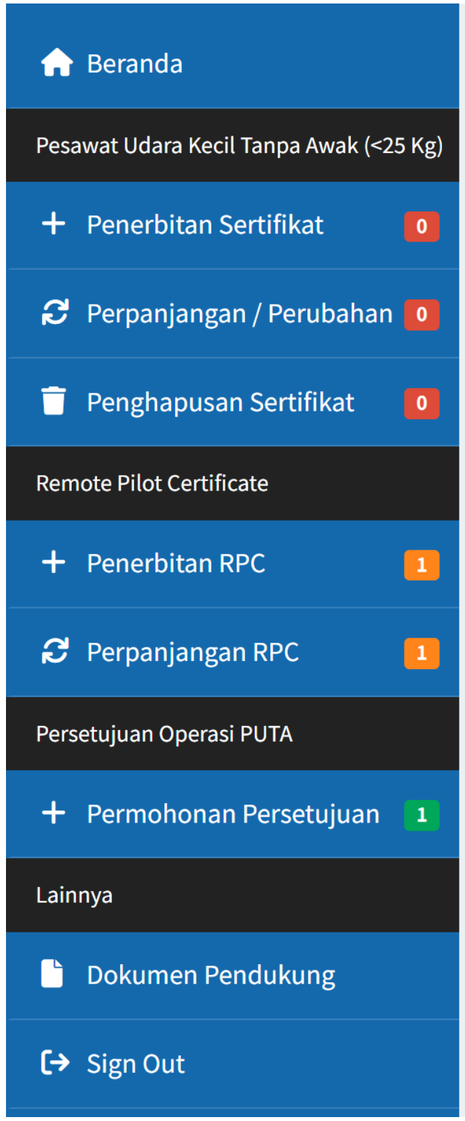
https://imsis-djpu.dephub.go.id/SidopiGO/Web/





UAS Registration

Remote Pilot Certificate

Operational Authorization

- Airspace Assessment
- coordination, communication and emergency procedure
- Insurance for 3rd party liability
- Approval

AAM Trial / Proof of Concept

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Demo Flight at Bali
25-26 November 2021

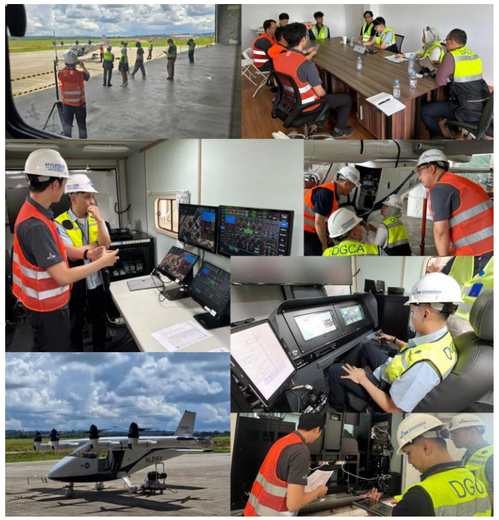
Trial Flight at Budiarto Airport
06 December 2023

Extended Trial Flight at Pantai Indah Kapuk
20 February – 05 March 2024

Ehang 216 Trial using Special CofA, Special CofR and Operation Authorization from DGCA

Proof of Concept AAM OPPAV KARI – Korea using Special Flight Authorization (SFA) and Operation Authorization from DGCA

Proof of Concept (PoC) at APT Pranoto Airport
26 – 29 July 2024



1 Already Have

2 **On Going Process**

3 What Next?

AAM Project in Indonesia

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Opening Opportunities for AAM Projects in Indonesia

1. Facilitating trials (EHANG, OPPAV KARI, Skyports)
2. Support domestic industries as AAM pilot project (Vela Airtaxi, Iter Aero Cargo delivery Drone)

Preparation of AAM Roadmap

Identifying existing regulations and planning for new, flexible regulations responsive to AAM technological advancements

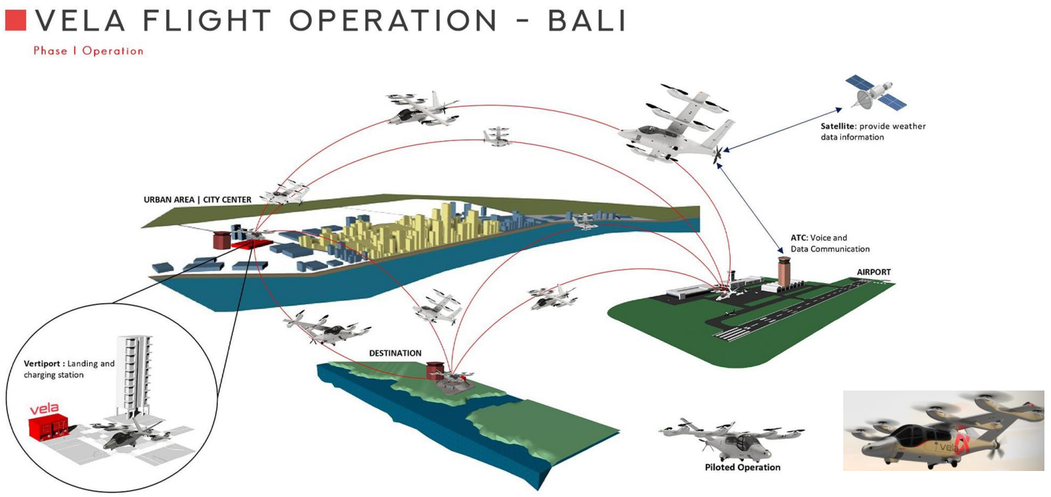
Covering:
1. Airworthiness (and Cont.), Operations Aircraft and Personnel certification
2. Airspace Management
3. Infrastructure and security (Vertiport, charging stations, urban airports)

Coordinating with relevant agencies, institutions, and local aviation industries in AAM and UAM development

Active Engagement in International Working Groups

1. JARUS
2. UCWG
3. AAMWG
4. APAC Workstream

Project	Type	Status
IA-25 Drone Delivery	Domestic	Type Certificate process
Vela Prima Nusantara eVTOL	Domestic	In Development
KARI/Hyundai OPPAV	Foreign	Demonstration/ Trial
EHANG 216	Foreign	Plan for TC Validation
ARCHER eVTOL	Foreign	Preliminary Discussions



Sandbox – Pilot Project

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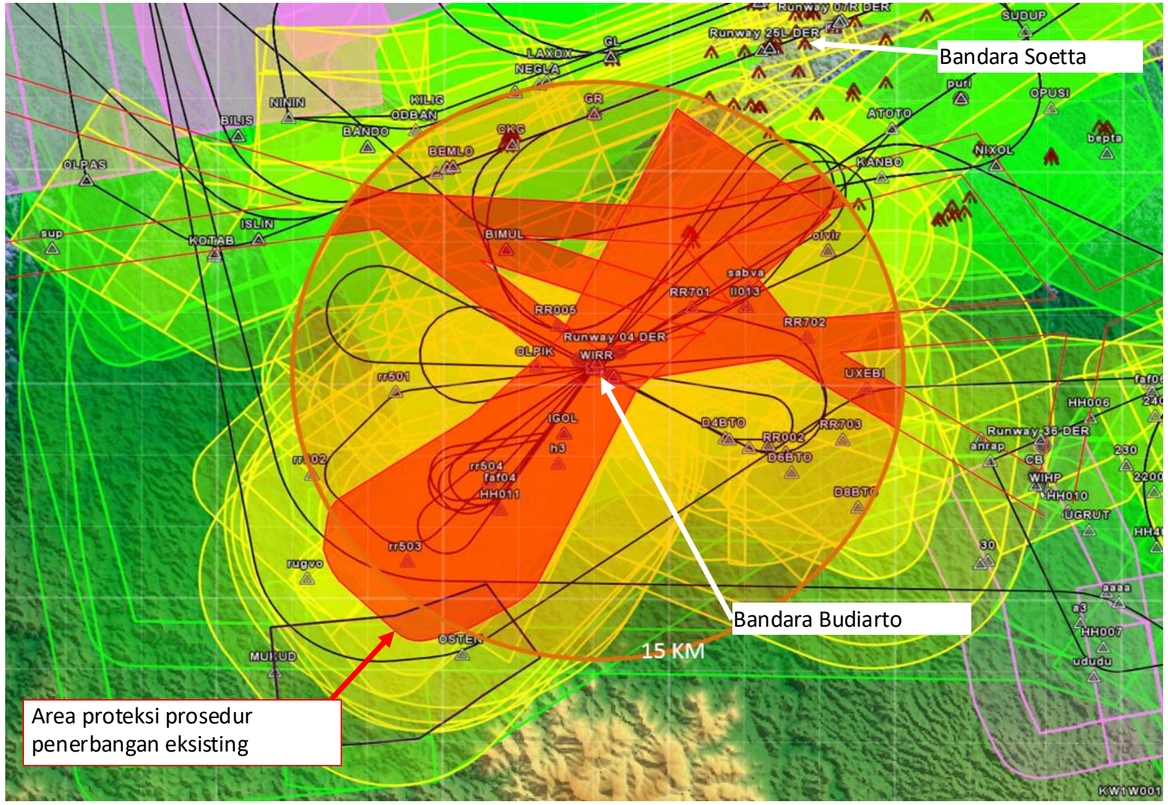
Remarks:
- Arrival (STAR)
- Approach (IAP)
- Departure (SID)
- Circling
- OLS
- VFR Route
- Radius 15 km from Budiarto Airport
- Unuseable area



Budiarto Airport

- ❑ Located in Tangerang
- ❑ RWY: 04-22, 12-30
- ❑ Aircraft's operate: commercial aircraft, general aviation. Flying school, flight calibration base
- ❑ Facilities: Electrical resources, Apron and Hangar, Airspace and flight procedure, Security Facility and firefighter, Meteorological Facility, Medical facility

The use of Sandbox

DIREKTORAT NAVIGASI PENERBANGAN

Flight Testing

Market Survey

Crew Training

R & D

New Technology Trial

1 Already Have

2 On Going Process

3 **What Next?**

UAS / AAM Integration

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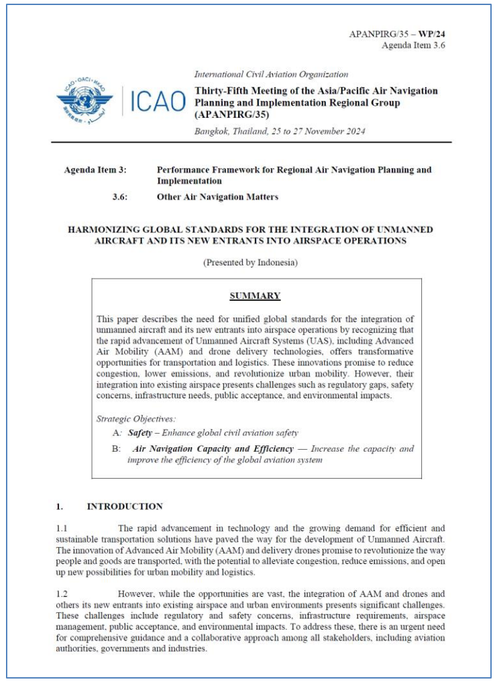
WP/24 presented by Indonesia in the APANPIRG/35 in Bangkok

“**Harmonizing Global Standards for the Integration of Unmanned Aircraft and Its New Entrants into Airspace Operation**”:



APANPIRG/35 – **WP/24**
Agenda Item 3.6

International Civil Aviation Organization

ICAO **Thirty-Fifth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/35)**

Bangkok, Thailand, 25 to 27 November 2024

Agenda Item 3: **Performance Framework for Regional Air Navigation Planning and Implementation**

3.6: **Other Air Navigation Matters**

HARMONIZING GLOBAL STANDARDS FOR THE INTEGRATION OF UNMANNED AIRCRAFT AND ITS NEW ENTRANTS INTO AIRSPACE OPERATIONS

(Presented by Indonesia)

SUMMARY

This paper describes the need for unified global standards for the integration of unmanned aircraft and its new entrants into airspace operations by recognizing that the rapid advancement of Unmanned Aircraft Systems (UAS), including Advanced Air Mobility (AAM) and drone delivery technologies, offers transformative opportunities for transportation and logistics. These innovations promise to reduce congestion, lower emissions, and revolutionize urban mobility. However, their integration into existing airspace presents challenges such as regulatory gaps, safety concerns, infrastructure needs, public acceptance, and environmental impacts.

Strategic Objectives:

A: ***Safety** – Enhance global civil aviation safety*

B: ***Air Navigation Capacity and Efficiency** — Increase the capacity and improve the efficiency of the global aviation system*

1. INTRODUCTION

1.1 The rapid advancement in technology and the growing demand for efficient and sustainable transportation solutions have paved the way for the development of Unmanned Aircraft. The innovation of Advanced Air Mobility (AAM) and delivery drones promise to revolutionize the way people and goods are transported, with the potential to alleviate congestion, reduce emissions, and open up new possibilities for urban mobility and logistics.

1.2 However, while the opportunities are vast, the integration of AAM and drones and others its new entrants into existing airspace and urban environments presents significant challenges. These challenges include regulatory and safety concerns, infrastructure requirements, airspace management, public acceptance, and environmental impacts. To address these, there is an urgent need for comprehensive guidance and a collaborative approach among all stakeholders, including aviation authorities, governments and industries.

Regulatory Frameworks

- Safety Standards
- Certification process
- Operational rules

Safety and Airspace Management

- UAS operation
- Coordination ATM with operators
- Integration with tradisional aviation

Environmental Consideration

- Reducing emission
- Electric propulsion systems
- Noise reduction technology
- Sustainable manufacturing

KEY FACTOR

Infrastructure Development

- Vertiports
- Landing pad
- Charging station
- UAS control center

Public Acceptance and Privacy Concern

- Public trust
- Operation transparency
- Privacy protection

AAM Implementation Workstream

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Certification

The type certification of AAM, integrating new design features, aircraft, and safety-enhancing technologies

Operational Suitability

1. Operations Certification
2. RPAS Certification

Airspace and Air Traffic Management

Planning, development, and implementation of airspace and ATM solutions, including development of airspace and route structures, policies procedures, and ATC training

Infrastructure

1. Existing Infrastructure like airport and heliport
2. New Infrastructure like new vertiports not co-located with airport or heliport and vertiports with multimodal connection
3. Vertiport related research like vertiport fire extinguishment, VTOL aircraft parking and Vertiport signage, marking and lighting
4. Vertiport standards and oversight

Environment

The analysis of noise and emiision impact from the manufacture information and opearional data

Hazardous Material Safety

Safety risk assessments accounting for hazardous materials being transported, can help to inform supplemental risk management strategies in AAM operations

Community Engagement

Changes in airport operations, airspace procedures, aviation infrastructure, and technology can have effects on communities and it is important to understand how that changes will impact the communities


Thank You