CORUS five

Thematic Area 2:
Airspace Organisation and Management + Aerodrome (and Vertiports) Operations

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CORUS five 2nd Workshop

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Structure

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Two Axis

Guiding Questions/ Principles	AOM	Aerodrome/ Vertiports Operations	
	• What **changes** are needed/ feasible in short-term **to current status quo**?	• What **changes** are needed/ feasible in short-term **to current status quo**?	**Short-term**
	• Should **traffic** be arranged (e.g. in vertical layers) **according to the aircraft performances**? ➢ C5 preliminary answer	• What are the **UAM management tasks** at **vertiports** and which of them could be **automated**? ➢ C5 preliminary answer	**Medium-term**
	• What **services** will have to be enabled for the **coexistence of GA / VCA and UAS**? • (open answer)	• How to **adapt A-CDM** for **drones and U-space**? • (open answer)	**Long-term**

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Temporal Horizons

Short-term

Establishing an **operational baseline** through implementation of mandatory and optional U-space services. The guiding principles would be compliance with the EU regulatory framework, safety by design and in implementation, risk-based implementation, airspace equity and fair access, and transparency and accountability. *Up to 2035 (new regulation expected).*

Medium-term

Enabling **higher-density, complex UAS operations with a higher level of automation**, supported by advanced U-space services. The guiding principles would be automation and predictive capabilities. *2035 to 2040.*

Long-term

Ensuring **seamless interoperability between traditional ATM system systems and U-space systems** to support operations in an integrated airspace. The guiding principles in this horizon would be harmonisation, and human-system integration with a high level of automation (Level 4-5 - manage by expectation or full automation). *2040+*

Temporal Horizons

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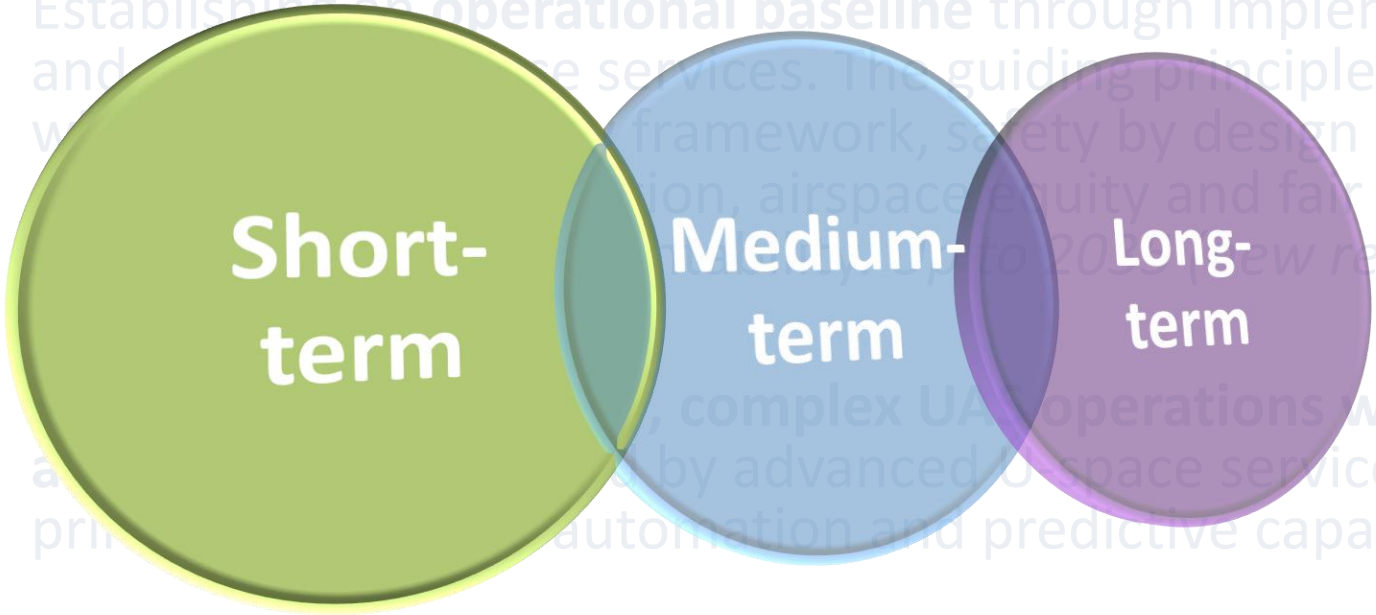

Temporal horizons may overlap

What we will do

Task:

Review and understand the guiding questions & preliminary answers

Provide

- Degree of agreement with answer/ refinement of answer
- Link to project results
- Link to regulation
- Link to working group, organization working on it

Outcome: Refined and updated table of answers per axis: AOM and Aerodrome/ Vertiports

AOM

Aerodrome/ Vertiports Operations

Gathering results in writting directly:

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Working session

80 minutes:

- 40 minutes on AOM
- 40 minutes on Aerodromes

AOM

Airspace Organisation and Management

U-space Airspace

Short-term

Key Features (STH):

- **Single class** of U-space airspace; **Designated only in high-demand areas**, not generally adjacent.
- **Mandatory services**: **U2** baseline (Network Identification, Geo-awareness, Flight Authorisation, Traffic Information) and **CIS**.
- **Located (mainly) at Very Low Level (VLL)** (< minimum heights for VFR flights, SERA 5005.f).
- May exist within **controlled airspace (CTR)**, but separated from aerodrome traffic flows to limit DAR activation.
- **U-plan is central**:
  - Functions as both flight intent declaration and **airspace access request**.
  - Operates like an **airspace reservation mechanism**, managed under first-come, first-served (FCFS).

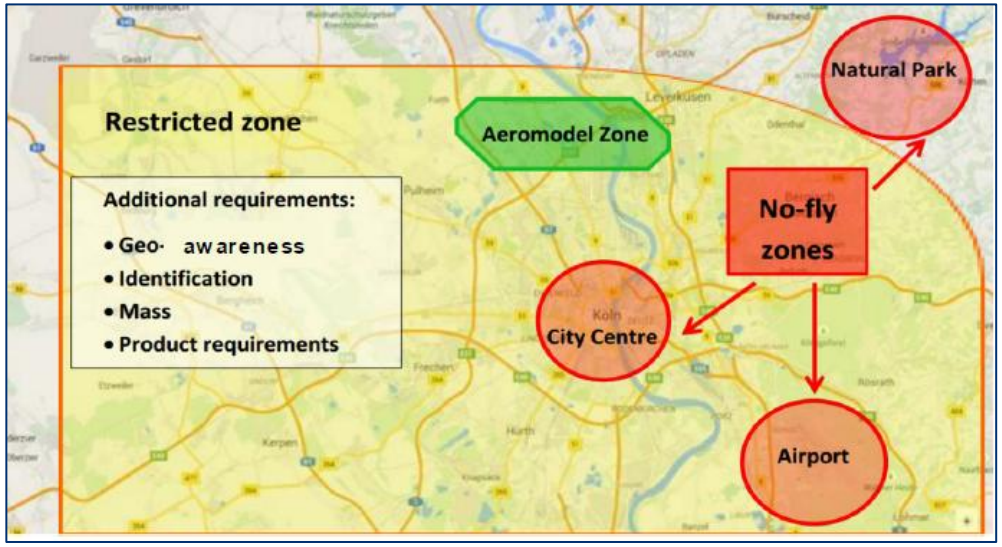
Short-term

Internal Structure

- May contain **nested UAS geographical zones** with additional constraints.
- Metadata (ED-318 condition language) ensures automatic **checking of U-plans** by U-space Service Providers (USSPs).

Flexibility for Member States:

- Member States can define zones to:
  - Awareness
  - Prohibit, require certain conditions or authorization
  - Require compliance with environmental standards
  - Allow access only to certain classes of drones
  - Allow access to drones with certain features or functions, eg Remote-ID or Geo-awareness



Airspace Organisation and Management

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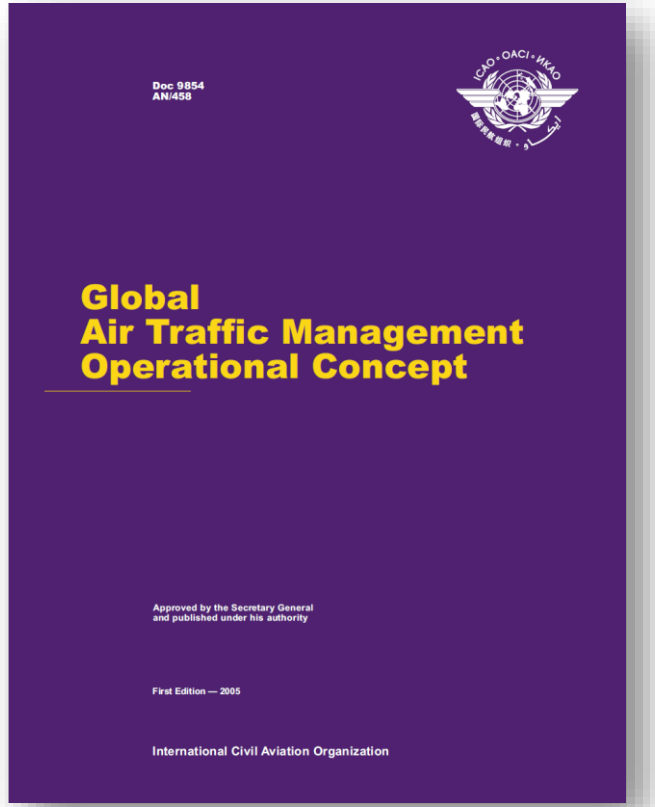
Short-term

AOM

Key Principle from **GATMOC (Doc. 9854)**

- **Civil-Military Coordination:** Civil-military airspace integration is essential, with mechanisms to **share airspace**, **coordinate operations**, and **minimize restrictions** while maintaining national security.



AOM Short-Term Question

AOM

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Short-term

What changes are needed/ feasible in short-term to current status quo?

Potential answers:

- ❑ Set of **pre-defined characteristics** and **performance requirements** for entry in U-space airspace;
- ❑ Above VLL;
- ❑ Less flexibility in the definition of geozones in benefit of higher standardization;
- ❑ Other.

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AOM Medium-Term Question

AOM

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Medium-term

What is your level of agreement with these principles for AOM in medium-term?

Key Principles from **GATMOC (Doc. 9854)**

- **Performance-Based Management:** Airspace is organized by required **performance levels**, enabling **flexible routing**, **dynamic sectorization**, and **real-time** adjustments to **traffic** and **environmental** needs.
- **Dynamic Use of Airspace:** Airspace is **dynamically reconfigured** in real time to respond to **traffic flows**, optimize **capacity**, and support **contingency operations**.

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AOM Medium-Term Question

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Medium-term

What mechanisms can ensure separation and conflict resolution between drones and traditional aircraft?

Potential answers:

- ❑ Layered Approach: Strategic conflict management, separation provision, collision avoidance;
- ❑ Dynamic Airspace: temporary segregation only when needed;
- ❑ Other.

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AOM Medium-Term Question

AOM

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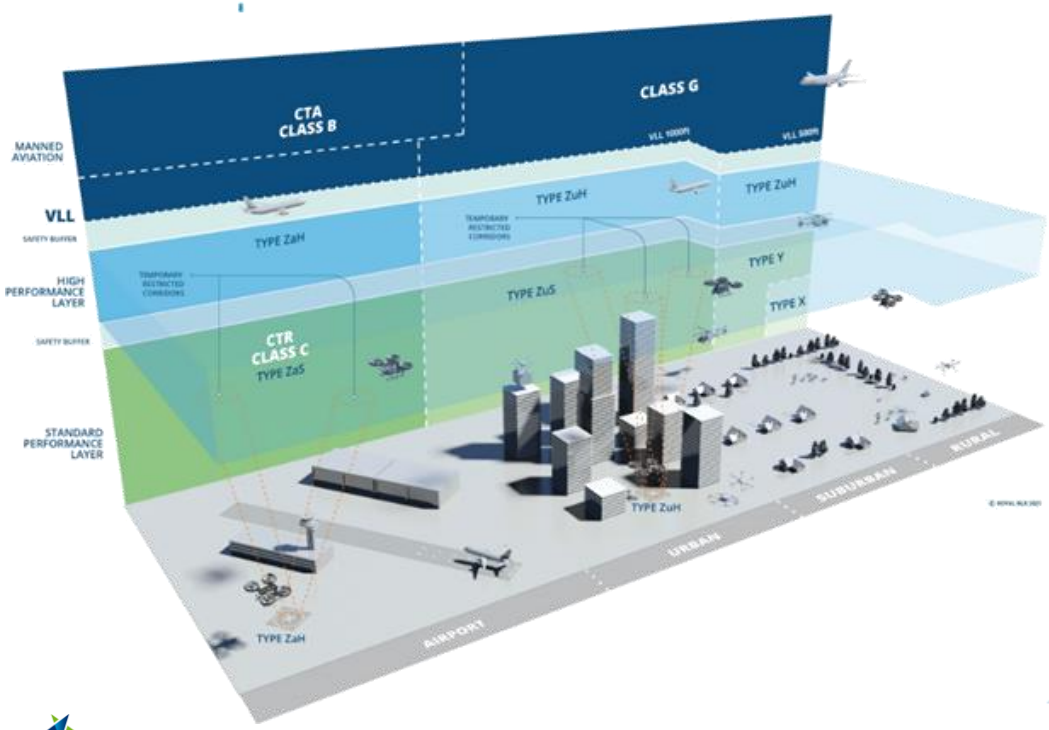
Medium-term

Should traffic be arranged (e.g. in vertical layers) according to the aircraft performances?

Concept clarification: AMULED airspace



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(Transitional) airspace types:

- X-Y-Z according to traffic volume (required services in support- e.g. tactical deconfliction)
- U-A: according to entity in control (U-space or ATC assisted by U-Space)
- S-H: according to vehicle requirements (Standard sUAS or High performing air-taxis)

Notes:

- Safety buffers between layers under development
- Promulgated V-TZ around vertiports
- Inter-city flights above VLL

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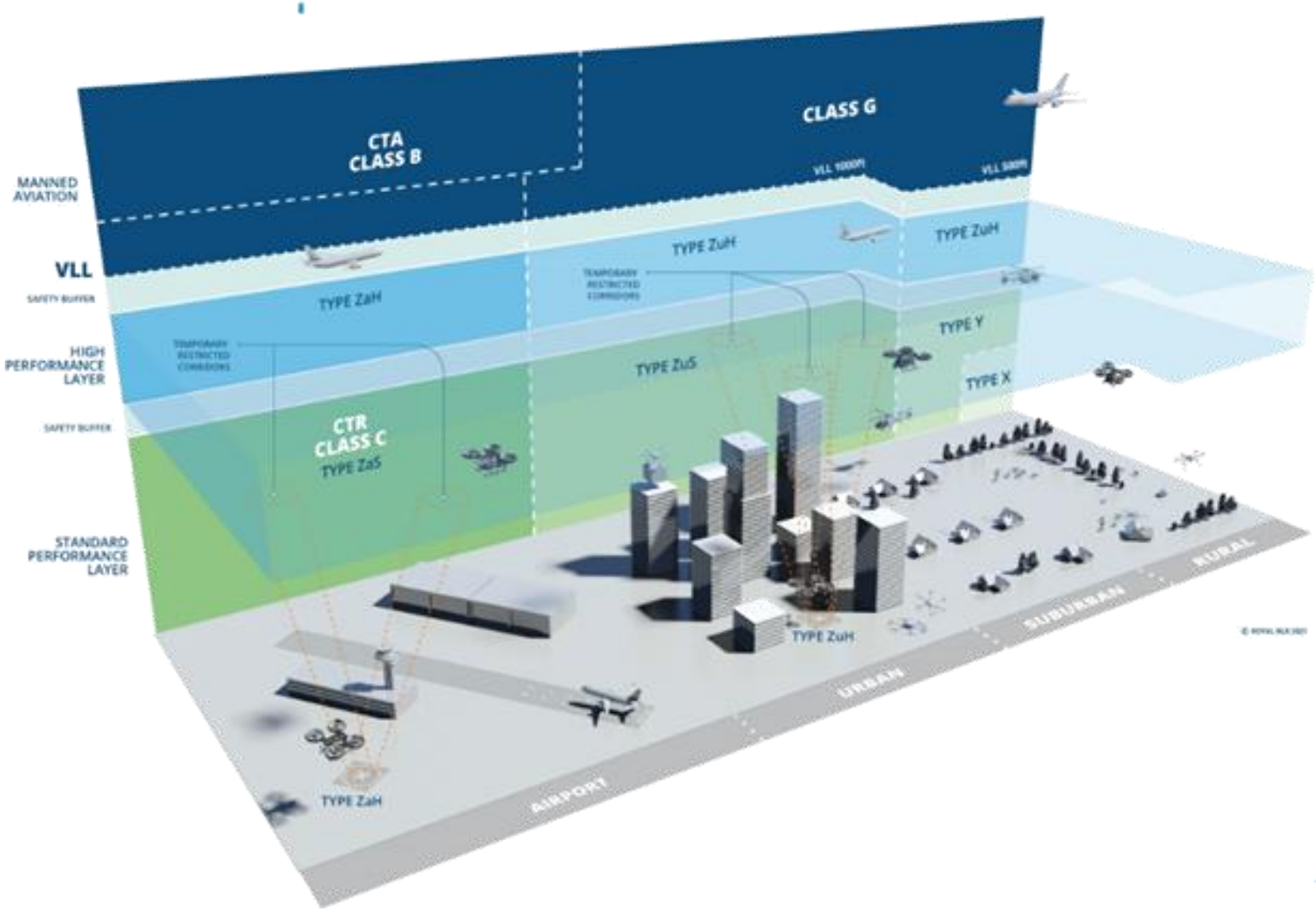
Concept clarification: AMULED airspace



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Notes:

- Safety buffers between layers under development
- Promulgated V-TZ around vertiports
- Inter-city flights above VLL

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AOM Long-Term Question

AOM

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Long-term

What is your level of agreement with these principles for AOM in long-term?

- **Performance-Based Management -** Performance-based management adapts airspace rules to diverse drone operations, enabling flexibility in low-altitude urban environments.
- **Harmonized Traffic Management –** U-space systems integrate with traditional ATM by sharing trajectory data and coordinating drone flight plans for safe airspace access.
- **Civil-Military Coordination -** Civil and military airspace authorities coordinate drone operations to manage sensitive and restricted areas effectively.
- **Future Airspace Strategies -** Long-term plans focus on high-density drone airspace design, global interoperability standards, and AI-based management technologies.

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AOM Long-Term Question

AOM

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Long-term

What is your level of agreement with this principle for AOM in long-term?

Key Principle from **GATMOC (Doc. 9854)**

- **All Airspace is Managed:** "managed" means any strategic or tactical decision is taken by the appropriate authority.

  In the context of integrating drones into controlled and uncontrolled airspace.

  - Does it include above VLL?
  - What services will have to be enabled for the coexistence of GA / VCA and UAS?

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Aerodrome/ Vertiports Operations

Aerodrome (and Vertiports) Operations

Aerodrome role in U-space

Aerodrome/ Vertiports Operations

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Short-term

- Aerodromes (incl. vertiports/ heliports) defined as ICAO/EASA facilities, but in STH they play a **limited role for UAS**.
- Most UAS ops **do not depend on dedicated infrastructure**, operating from flexible locations.
- Some early cargo/logistics ops may use ground facilities (charging, loading/ unloading).

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Integration with manned aviation

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Aerodrome/
Vertiports Operations

Short-term

- U-space airspace kept at sufficient distance from controlled aerodromes and procedures.
- Passenger UAS/VCA operations not foreseen in STH.
- No specific U-space services yet for aerodrome integration; operators handle their own arrangements.

Aerodrome Operations

Short-term

Emergency Response Plan at or near Aerodromes? Key actions from GATMOC (Doc. 9854):

1. **Immediate Reporting and Verification:** immediate reporting, use of detection/verification tools.
2. **Activation of Emergency Response Plan:** Suspend/restrict ops, notify all stakeholders.
3. **Coordination and Communication:** Real-time updates, clear roles for ATC, ops, law enforcement.
4. **Law Enforcement and Security Involvement:** Investigate, locate operator, deploy counter-drone tech if authorized.
5. **Use of Surface Movement and Detection Systems:** Track drone with surface movement and detection systems.

6. **Dynamic Risk Assessment and Decision-Making:** Continuous monitoring, coordinated decision to resume ops.
7. **Post-Incident Review and Reporting:** Debrief, update procedures, share lessons learned.

Aerodromes Short-Term Question

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Aerodrome/
Vertiports Operations

Short-term

What changes are needed/ feasible in short-term to current status quo?

Potential answers:

- ❑ Development of **basic ground facilities** (charging, loading/unloading) at selected aerodromes/vertiports for early cargo/logistics UAS;
- ❑ Initial **interfaces for data sharing** between aerodrome operators and USSPs (surface movement info, detection systems);
- ❑ Stepwise preparation for future passenger ops. Identify **requirements** (safety, security, infrastructure) for eventual **passenger UAS/VCA ops**, though not realisable in STH;
- ❑ Other.

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Aerodromes Medium-Term Question

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Medium-term

Aerodrome/ Vertiports Operations

What is your level of agreement with these principles for Aerodrome Operations in medium-term?

Infrastructure and Operational Principles from **GATMOC (Doc. 9854):**

- **Critical Infrastructure Nodes -** Aerodromes and vertiports serve as essential ground infrastructure for diverse vehicle types including drones and VTOL aircraft.
- **Operational Integration -** Vertiports are integrated into surface movement and ATM systems to optimize capacity and ensure safety.
- **Real-time Data Sharing -** Real-time position and intent data sharing enable precise surface guidance and full operational capacity in all weather conditions.
- **Environmental and Community Focus -** Design and operation consider noise, emissions, and visual impact to minimize environmental and community effects.

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Aerodromes Medium-Term Question

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Medium-term

Aerodrome/
Vertiports Operations

How to adapt A-CDM for Drones and U-space in the medium-term?

A-CDM Element (from GATMOC (Doc. 9854))	**Adaptation for Drones/U-space**
Performance Monitoring	Establish KPIs for drone operations in the airport environment
Stakeholder Collaboration	Involve U-space/drone reps in A-CDM meetings and planning
Regulatory Framework	Update procedures to include U-space and drone operators

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Aerodromes Medium-Term Question

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Medium-term

Aerodrome/
Vertiports Operations

What are the safety risks of drone operations near aerodromes, and how can current surface movement systems mitigate them?

Safety Risk	Surface Movement System Mitigation
Rapid escalation	Real-time surveillance and incident response
Deliberate disruption	Coordinated response protocols
Economic/operational impact	Minimizing disruption through fast mitigation

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Aerodromes Medium-Term Question

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Medium-term

Aerodrome/
Vertiports Operations

What is the airspace classification of the “vertiport airspace”?

Potential answer:

- **Vertiport Traffic Zones (VTZ):**
  - Physical and digital areas designed to manage the movement of VCA and UAS and ensure safety, efficiency, and integration with broader transport networks;
  - These zones can include operational areas for landing, battery charging, and cargo handling within the vertiport, as well as surrounding airspace for approaches and departures;
  - They would integrate into existing ICAO classes rather than create a new category. Option to treat them more as protected or safeguarded zones linked to operations than as formal new class of airspace.
- Other.

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Aerodromes Medium-Term Question

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Medium-term

Aerodrome/ Vertiports Operations

What is the responsibility of the vertiport on the surveillance and management of the airspace around it?

Potential answer:

- ❑ Airspace surveillance remains under ANSP/ATC or USSP/CISP roles, but **vertiports are expected to support by monitoring the immediate environment** (obstacle data, intrusions) and coordinating safety-related Information.
- ❑ Other.

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Aerodromes Long-Term Question

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Long-term

Aerodrome/
Vertiports Operations

How to adapt A-CDM for Drones and U-space in the long-term?

A-CDM Element (from GATMOC (Doc. 9854))	**Adaptation for Drones/U-space**
Trajectory Management	Include drone trajectories in ATM planning and negotiation
Information Sharing	Connect U-space systems to A-CDM info-sharing platforms (e.g., SWIM)

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Aerodromes Long-Term Question

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Long-term

Aerodrome/
Vertiports Operations

What are the safety risks of drone operations near aerodromes, and how can current surface movement systems mitigate them?

Safety Risk	Surface Movement System Mitigation
Collision with manned aircraft	Enhanced detection, trajectory management
Runway/airspace incursion	Automated alerts, rapid info sharing
Detection/identification difficulty	Integrated drone detection with SMR/A-SMGCS

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Aerodromes Long-Term Question

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Long-term

Aerodrome/
Vertiports Operations

What are the UAM management tasks at vertiports and which of them could be automated?

Potential tasks:

- ❑ surface management;
- ❑ arrival/departure coordination;
- ❑ resource allocation;
- ❑ slot management;
- ❑ coordination with ATC/USSP;
- ❑ dynamic pad allocation;
- ❑ occupancy monitoring;
- ❑ Other.

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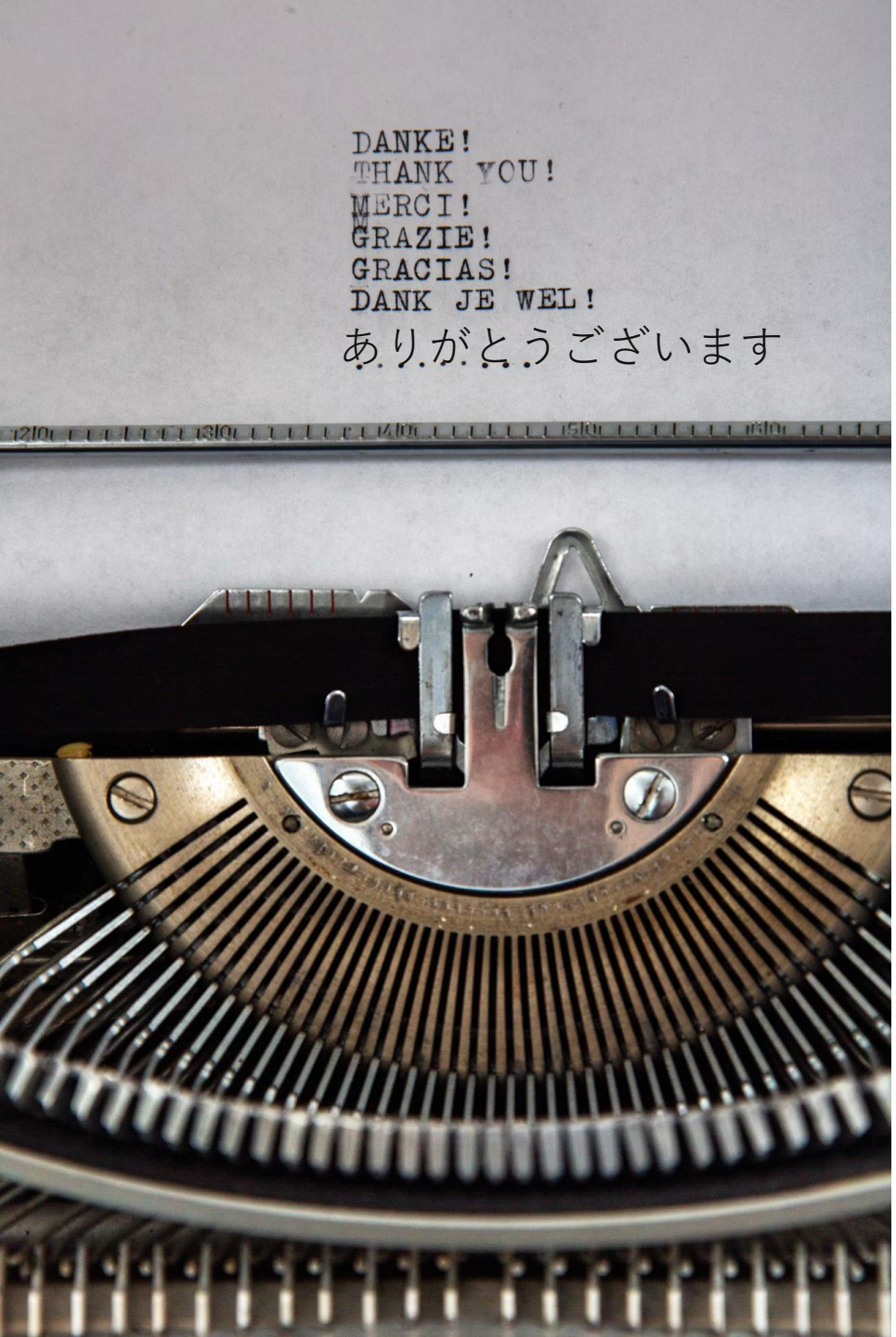

Thematic Area 2:
Airspace Organisation and Management + Aerodrome (and Vertiports) Operations