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SCAN ME

EASA Innovative Air Mobility Implementation Forum

In cooperation with:

Alliance for New Mobility Europe · ASD · Drone Alliance Europe · Global UTM Association · JEDA

Lessons learnt from the first USSP (and s-CISP) certifications

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EASA, Programme Manager Drones

Stéphane VAUBOURG
EASA, Drones Project Manager U-space

Darren Pong-Loi
DGAC/DSAC, Inspector for SCISPs-USSPs

Amit Ganjoo
ANRA, CEO

Alberto Iovino
ENAV/D-Flight, Head of Operational Support and IAM Mgt

Workshop title

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Goal:

→ To share the most important lessons learnt from the on-going certification process from EASA and from the National Civil Aviation Authorities

→ To share the lessons learnt from applicant USSPs which are related to ANSPS

→ To share the lessons learnt from applicants USSPs which are not related from ANSPs. How to prepare for a formal certification process?

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Certification process

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- → Organisation Approval is a known territory (Approach inspired from the ATM/ANS processes, practices)
- → Coverage of investigations is so far adequate (Electronic HW items TBC)
- → A better understanding of the goals, scope, and depth of the technical investigations needs to be achieved
- → Areas still required to be tailored for U-space (.e.g. occurrence reporting, change management and notification)
- → Certification effort/timeframe is globally under-estimated by the stakeholders (e.g. review, iterations)

Certification is NOT an administrative process but a technical exercise

Certification driver

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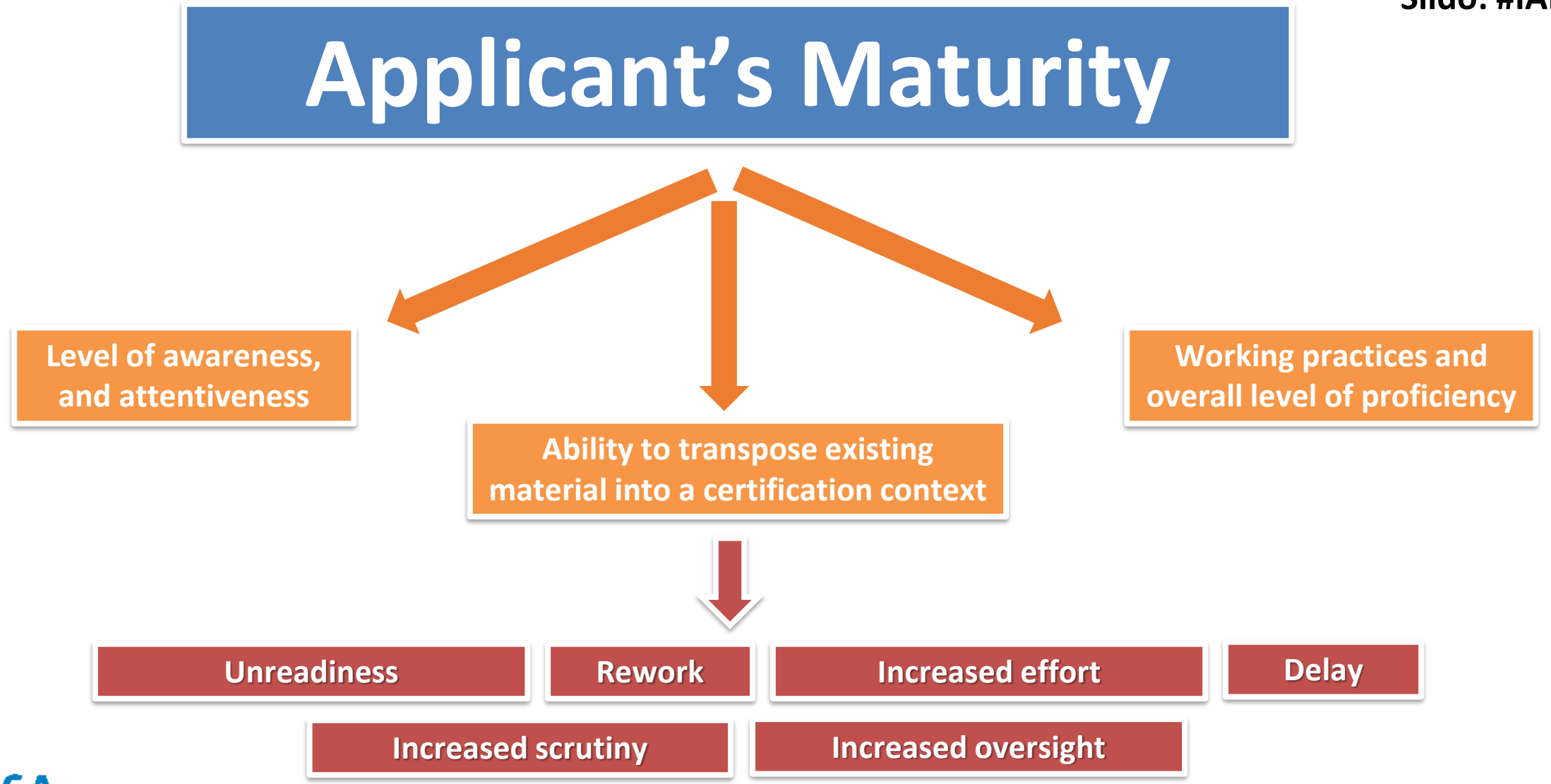

Certification enabler/facilitators

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Training **External support**

→ Increase scope and depth of internal competencies

Readiness

→ Ensure availability at application time of: CONOPS, full compliance matrix, management system manual/procedures
→ Processes have to be worked out prior application (Software!)

Familiarisation meetings

→ At the beginning of the certification, for each of the domain investigated
→ To get understanding of the Applicant's platform/product, methods, processes/procedures…
→ To provide advises prior the investigations

"Workshops" / Pre-audits *(F2F)*

→ To minimise iterations
→ Effective review of the Applicant data
→ Agreement on content and/or necessary resolution

DILIGENCE & RIGOR

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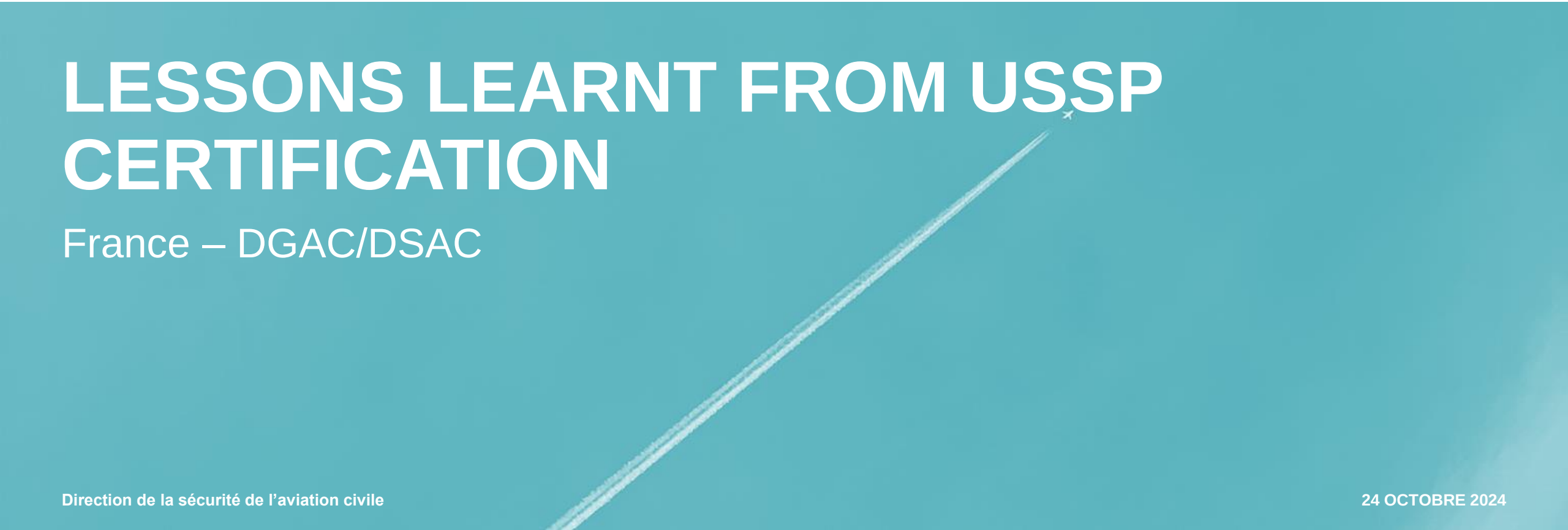
MINISTÈRE
CHARGÉ
DES TRANSPORTS

Liberté
Égalité
Fraternité

dgac direction générale de l'Aviation civile
DSAC

LESSONS LEARNT FROM USSP CERTIFICATION

France – DGAC/DSAC



Direction de la sécurité de l'aviation civile

24 OCTOBRE 2024

Context

SME certification in progress	• 4 mandatory services + conformance monitoring service • Kick-off : Sep 15, 2023
Officers in charge	• 2 certification officers + 3 experts

Lessons learnt from USSP certification

U-space services

Documentation and formalization

Software assurance

Change management procedure , Safety Assessment (SA), Safety Support Assessment (SSA)

Insurance cover

Lessons learnt from Competent Authority

ATM/ANS vs U-space	• Similarities and differences • Functional system, risks, etc.
Knowledge and expertise	• U-space & software
Process	• Realistic : no identified showstopper

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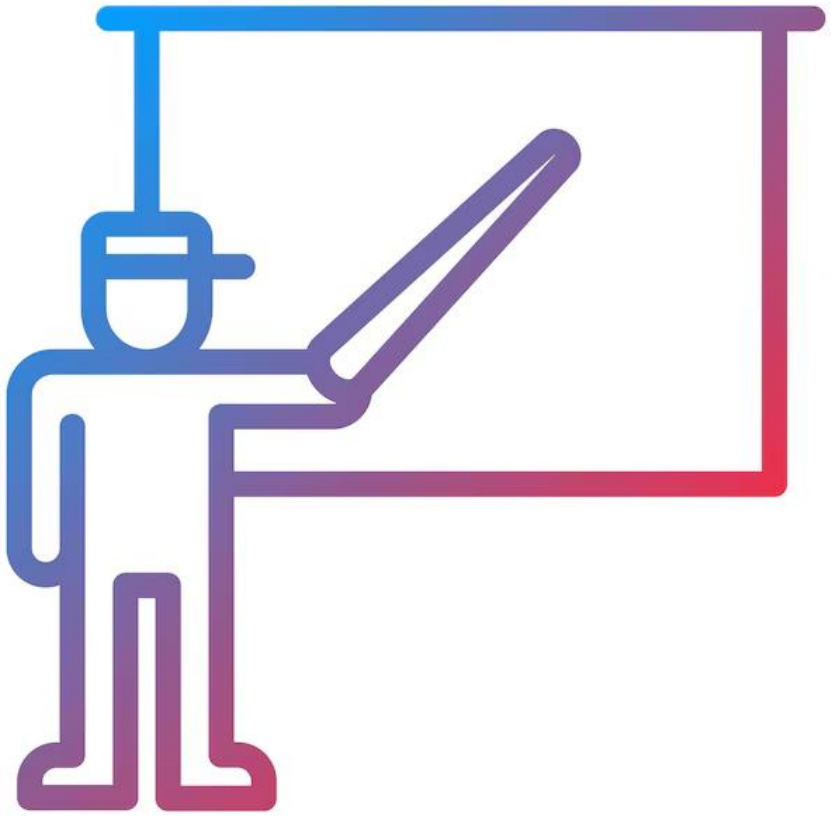
Key Lessons from EASA Certification Process

- Being first is hard as no existing blueprint exists
- Needs Early Engagement with Regulators
- Need for Comprehensive Documentation
- Iterative Feedback Process



Challenges Faced by Small USSPs Not Associated with ANSP

- Limited Resources
  - Small companies lack compliance teams.
  - Certification expense could be a barrier to entry
- Technological Integration
  - Prove compatibility with ATM systems without existing standards
- Compliance
  - Meeting stringent data security requirements.
  - No known testing criteria to prepare towards

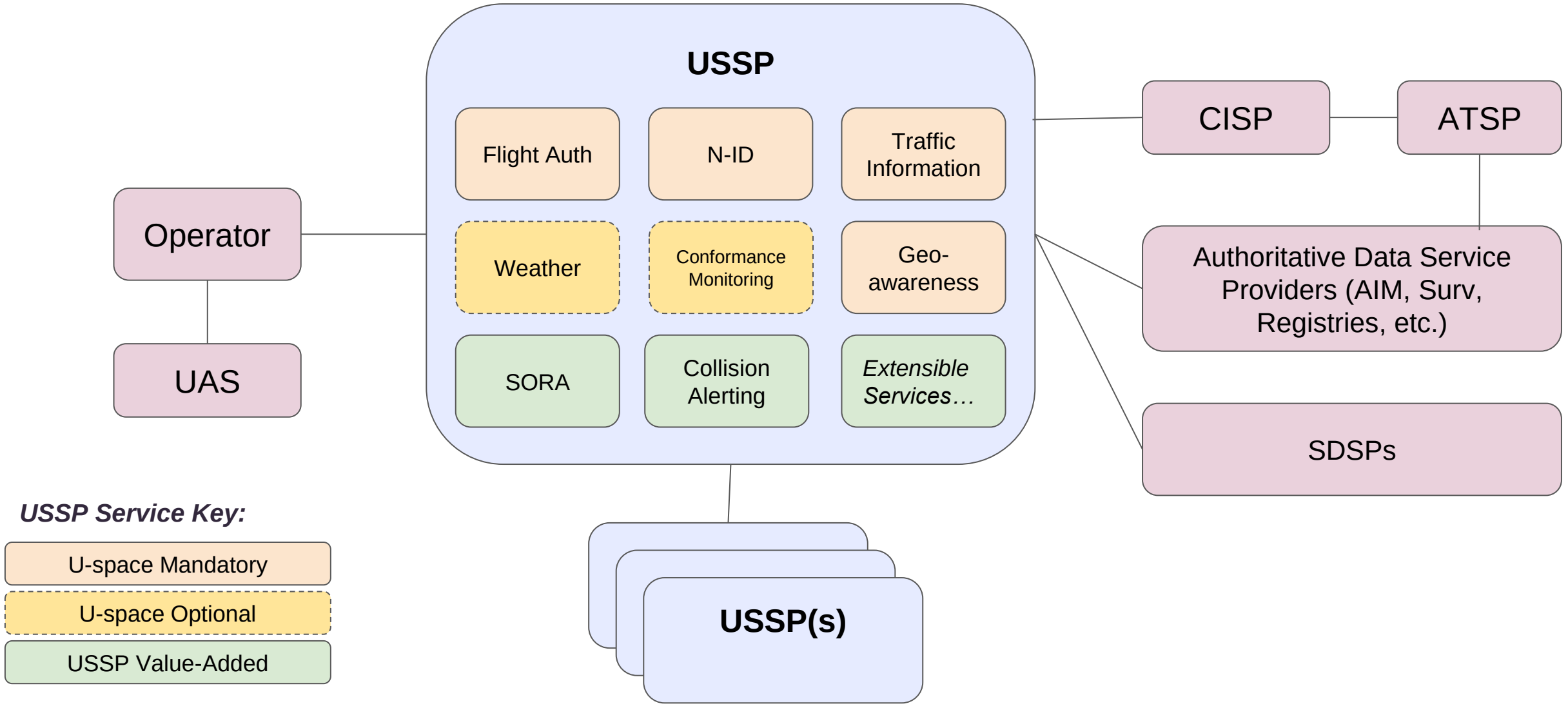
Preparing for Certification as a Small USSP Entity

- Operational Risk Management
  - Develop a risk assessment process.
- Lean Documentation
  - Create concise operational procedures.
- Agility in Implementation
  - Use small company agility to adapt quickly.
- External Support
  - Engage with certification bodies and industry experts.
- Hypothetical U-space
  - Having to make assumptions about hypothetical U-space airspace and demand

Recommendations for Independent USSPs

- Incremental Certification (Mandatory Vs Optional Services)
  - Start with basics and scale up.
- Leverage External Expertise
  - Engage with consultants and specialists.
- Collaborative Engagement with Regulators
  - Build relationships with authorities.
  - Alignment with the rest of industry or trade groups
- Focus on Interoperability
  - Ensure seamless integration with U-space systems.

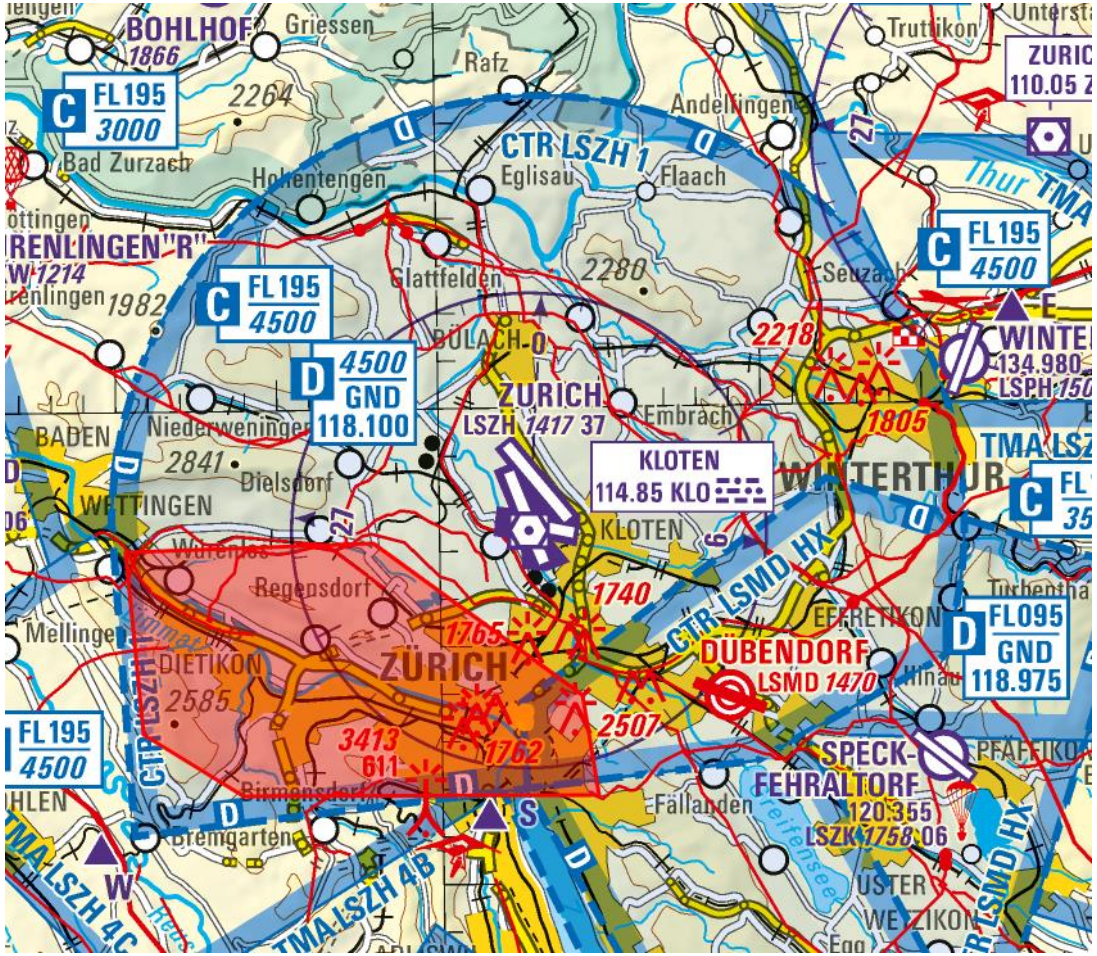
Roles in a U-space Architecture



Roles in a U-space Architecture

- In this U-space architecture, the roles are defined, but the interactions between them occur through decentralized mechanisms:
  - CISP (Common Information Service Provider) - Coordinates information between multiple USSPs and ATC and ensures data integrity across the system.
  - USSPs (U-space Service Providers) - Independent service providers that deliver specific U-space services such as flight authorization, tracking, and deconfliction.
  - UAS Operators - Interact directly with USSPs for flight planning, approvals, and airspace coordination.
  - ATC (Air Traffic Control) - Provides oversight and coordination for manned aviation, working with USSPs to ensure airspace safety.
  - Authorities - Maintain regulatory oversight but allow USSPs to operate autonomously.
  - Local U-space Coordinators - Regional entities that can coordinate geo-zones while relying on data from multiple USSPs and the CISP.
- In this model, each entity operates independently, but communication and data sharing are streamlined via common standards and the CISP.

U-space airspace in Zürich



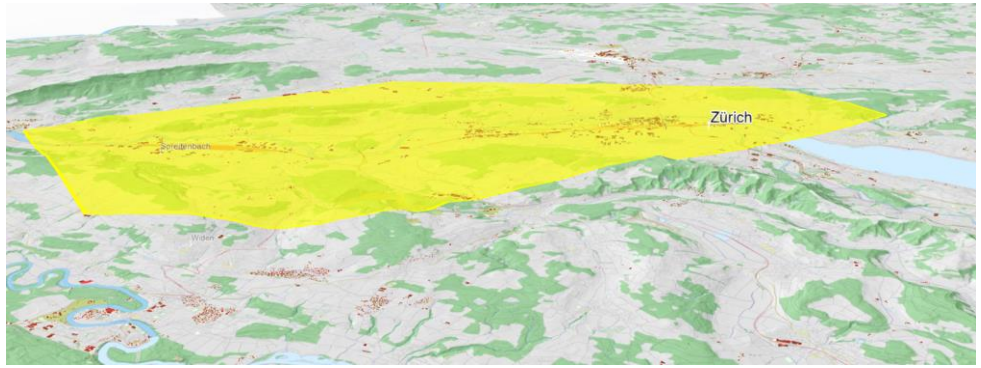
200,000 yearly UAS operations prognosed by 2035

(>40 flights every single hour)

Fully within Class D (CTR) airspace

Extends across 17x10km

3km away from Zürich International airport



From GND to 2500ft AMSL
Maximum UAS usable altitude 1000ft AGL

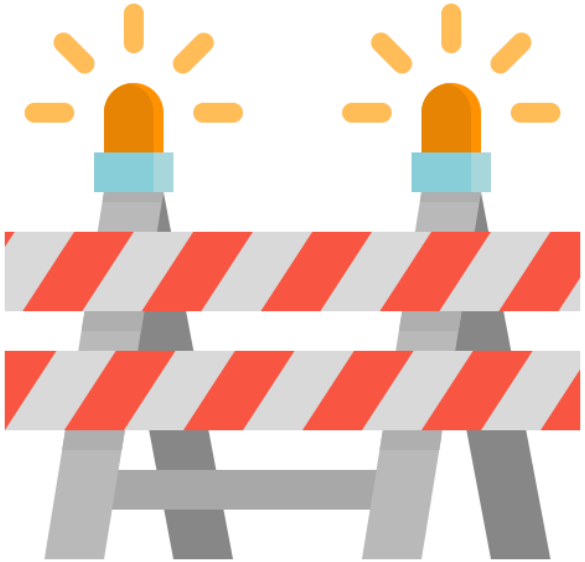
Overview ARA U-space airspace Zürich

	GROUND RISK	AIR RISK
HAZARD IDENTIFICATION	7 scenarios were analysed	9 scenarios were analysed
RISK ASSESSMENT	1 scenario was quantified	4 scenarios and one sub-scenario were quantified

Icon: flaticon.com

Air and Ground Risk Scenarios and Barriers

- Risk Scenario Analysis
  - Qualitative Hazard Identification: 200,000 BVLOS drone flights (Mo-Su, 9 AM - 5 PM)
  - Quantitative Risk Assessment: Critical air and ground risk scenarios evaluated
- Effectiveness of Barriers
  - Traffic information services to avoid mid-air collisions evaluated
  - Ongoing analysis of risk management and U-space systems
- Challenges Identified
  - Reliability of traffic information services due to radar shadows, data relay latency
  - Operator response in SORA is addressed but must be incorporated into U-space risk



Performance Requirements for UAS, USSP, and U-space Operations

- UAS Performance Requirements
  - Defining BVLOS operational standards for high-density airspace
- USSP Performance Requirements
  - Establishing standards for system reliability, communication, and data handling
- U-space Operational Requirements
  - Operating times, simultaneous flights, distance between paths being defined
- Reliability of Traffic Information Service
  - Ensuring end-to-end system reliability, accuracy, and timely information flow

Next Steps in U-space Risk Assessment and Performance Requirements

- Ongoing Efforts
  - Refining performance requirements for UAS, USSPs, and U-space systems
- Regulatory Considerations
  - Traffic Information Service Standardization: Establishing standards for traffic display
  - Collaborating with ATC to ensure manned aircraft are conspicuous
  - Integrating SORA operator actions into U-space risk frameworks

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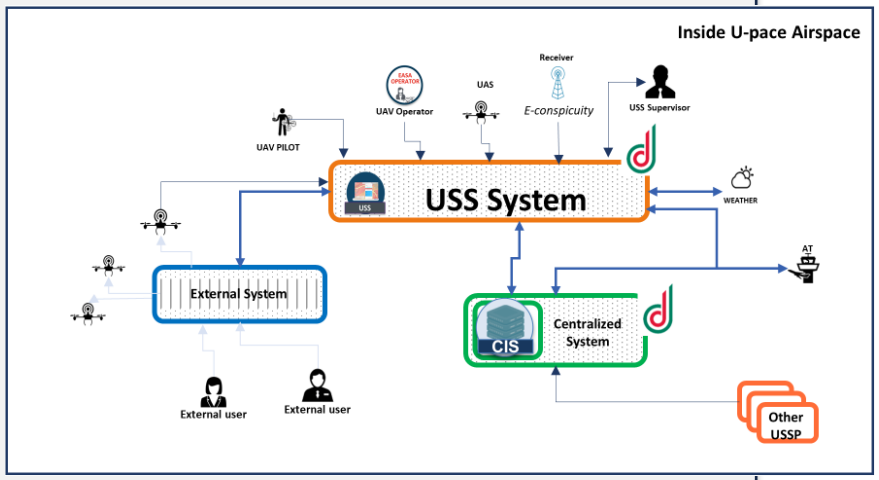
d-flight Single CISP / USSP Certification

- ✓(CISP Designated by CAA) – submitted application
- ✓CHECKLIST – reference to requirements/AMC, GM as useful (e.g. CONOPS)
- ✓Roadmap agreed with CAA Certification Team
- ✓Deliverables:
  - DOCS: , organization, management system, CONOPS, technical specs,
  - business plan, etc.
  - ….: platform induction
  - LIVE DEMO
- ✓Deadline: November



Business model:

- ✓deployment and initial phase:
  CISP public funded - USSP private investment
- ✓in perspective: user fees

CISP/USSP Certification issues & lessons learnt

- ✓ Benefits from expertise and well-established relationship with CAA as certified ANSP: management system requirements are challenging
- ✓ To ensure fairness, functional / financial separation between ANSP, CISP and USSP at organizational level
- ✓ Links to ARA: general vs. local requirements
- ✓ Insurance terms not obvious (e.g. risks, premiums, guarantees)

General issues

- More time is required for European standards -> AMC/GM for U-space 1.1 by 2026
- Accomodate first comers requiring U-space

SOLUTIONS

- Focus on an iterative/stepwise approach for managing complexity
- Dimension of U-space: Deploy U-space focused on BM and as much as possible tailored (with small volumes) focused on rutinary UAS operations.

Company General Use

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