RPAS ACTIVITIES IN EUROPE

Mike Lissone
UAS ATM Integration Manager
22/04/2013
MAIN OBJECTIVE

Safe integration of initial RPAS operations into the European aviation and ATM system from 2016

- Non-segregated ATM environments
- SESAR COMPLIANT – Integrated into the European ATM Master Plan
RPAS Integration in ATM

- RPAS is not the future – it is here – activities are on-going
- RPAS to adapt to ATM – not the other way around – just another airspace user
- The objective is to integrate initial RPAS operations in the European Airspace and ATM environments – connect operational improvements to the European ATM Master Plan
- Issues and opportunities to be worked on;
  - Terminology
  - Predictable 4 D Trajectories – planning/execution
  - Detect and Avoid systems – sense vs. see-and-avoid
  - Data communications – aircraft control and command – ATC communications
  - SWIM
  - Automation and Human-in-the-loop
  - Certification – airworthiness – model/toys vs. RPAS
  - Training
- Demonstrations
Identification of gaps in technology or procedures led to the following topics:

- Detect & Avoid
- Human factors
- C2 (Command & Control)
- Contingency – e.g. loss of link, ...
- Security
- SESAR compliance
(E)VLOS
Very Low Level operations (<500 ft AGL)
**VLOS & E-VLOS**

**Timeframe 2013-2018**

Small R&D effort identified:

- Security – e.g. flight planning operations
- Human factors – e.g. pilot & observer team work
- Contingency
B-VLOS
Very Low Level operations (500 ft AGL)
B-VLOS

Timeframe 2013-2020

Large R&D effort identified

- Detect & avoid (replicate the human ability to see & avoid)
- C2 communications
- Human factors including mixed fleet compatibility
- Contingency
- Security
- SESAR compliance

- B-VLOS below 500ft is completely new to aviation
Timeframe 2013-2028

Large R&D effort identified

- Detect & avoid
- Airspace and Airports access
- C2 communications
- Human factors
- Contingency
- Security
- SESAR compliance
RPAS R&D INTEGRATION PERSPECTIVE

R&D Objectives

- E-VLOS: Small R&D effort
- B-VLOS: Large R&D effort
- IFR/VFR: Large R&D effort

Operations Based Approach
EUROPEAN RPAS R&D ROADMAP TIMELINE

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Integration timeline:
- Initial operations (VFR, IFR, BVLOS, EVLOS, VLOS)
- Critical path initial operations
- Critical path integration
- Critical path evolution

Q1, Q2, Q3, Q4 indicate quarters of each year (e.g., Q1 = first quarter, Q2 = second quarter, etc.).
INTERDEPENDENCIES

- R&D and REG are interdependent: most of the requirements for RPAS integration are regulatory requirements but also around liabilities and privacy

- Ensure closed loop of activities to ensure consistency and feasibility
Reason for later start of VFR operations than IFR is due to the integration complexity and required operational experience with IFR RPAS integration in airspace classes, which is linked to the phased integration approach.

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**IFR RLOS**
- TLS for C2 and D&A 216/2008 amendment proposal
- MOPS C2
- Amendment SES rules MOPS D&A RPL common rules AMC RPAS ops.
- ETSD’s
- OSED, SPR Interop. Req. Airspace/Airports datalink
- Flightplanning
- D&A Cooperative Contingency
- Human factors
- Security D&A full solution

**B-VLOS Specific meteo conditions**
- Insurance rules (785)
- REG Gap analysis
- SES proposal
- Harmonised req. and amendment of SES rules
- Transposition at national level
- VLL, ATM impact study
- C2 RLOS
- C2 BRLOS
- Human factors
- Airspace D&A Contingency
- Security

**E-VLOS**
- Insurance rules (785)
- Harmonised European REG requirements
- Transposition at national level
- Start 2013 Security
- Human factors

**VLOS**
- Insurance rules (785)
- Harmonised European REG requirements
- Transposition at national level
- Start 2013 security

Legend:
- Complementary dependencies
- Initial national operations
- Regulatory dependencies
- Limited access
- R&D dependencies
- Full integration
RPAS are seen as another but new airspace users

Integration principle is to fit into the ATM environment:
- Present
- Future

Essential to incorporate RPAS Operations into the ATM Master plan
EUROCONTROL’ role

- Founder UASSG
- Co-founder SESAR JU
- Main contributor EC roadmaps development
- Support to industry standards
- Integration support to:
  - States
  - Mil
  - Regulators
  - ANSP
  - CIV/MIL
**Outcome UAS Regulatory Gap Analysis Questionnaire**

- **Objective:**
  - To ensure to get the full picture
  - New and/or updated information from Stakeholders
  - Current status of UAS ATM Integration in National Framework

- **Questionnaire sent to UAS Coordination Group – 46 Stakeholders**
- **Total Responses received - 29**

### Experience in developing UAS Regulations

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### Already put in place UAS rules and regulations

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### UAS procedures/instructions established

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**Experience in developing UAS Regulations**

- Yes: 41%
- No: 52%
- N/A: 7%

**Already put in place UAS rules and regulations**

- Yes: 41%
- No: 38%
- N/A: 7%

**UAS procedures/instructions established**

- Yes: 72%
- No: 21%
- N/A: 7%
Current Status Civ UAS Regulation in Europe per State
Current Status Civ UAS Regulation in Europe per State

- UAS Regulation in place
Current Status Civ UAS Regulation in Europe per State

- No regulation but operational facilitation
Current Status Civ UAS Regulation in Europe per State

- No UAS Regulation at all
Current Status Civ UAS Regulation in Europe per State

- No Response (or no Focal Point)
Current Status Civ UAS Regulation in Europe per State

- UAS Operations partly regulated
Current Status Mil UAS Regulation in Europe per State

- State Regulation in place for Military UAS
Current Status Mil UAS Regulation in Europe per State

- No Response (or No Focal Point)
Current Status Mil UAS Regulation in Europe per State

- No UAS Regulation in place
Current Status Mil UAS Regulation in Europe per State

- No Regulation but operational facilitation
EUROCONTROL Consultation Forum

All ECTL member States

EC

SESAR

ML, ANSP and CAA

Best practices

Sharing latest integration efforts

Support

Awareness

GOAL

Integration Support

- Switzerland
- Industry
- NATO
- EC
- ESA
- EDA
- Universities

Regulatory Support

- Support States in development of regulations
- Goal: Drive harmonisation
- Use JARUS material

Consultation Forum

- All ECTL member States
- EC
- SESAR
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- Awareness

Working together with

- ICAO - UASSG
- EC
- SJU
- EUROCAE WG 73 & 93
- EASA
- JARUS
- STATES
- Industry
- FAA AP24 CP3.4

EUROCONTROL

UAS

Integration Support

Switzerland
Industry
NATO
EC
ESA
EDA
Universities

Regulatory Support

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EUROCONTROL

UAS
CONCLUSION

Thanks to the work performed through the RPAS roadmaps and ECTL work programme:

- Consolidated approach
- We know what needs to be done
- We know how to do it
- We are underway
- R&D, Regulatory and complementary (e.g. liability, privacy…) dependencies are identified together with the connection with the synergies of ongoing SESAR activities