Unmanned aerial vehicles (drones)
Working Group on Legal Questions Related to Robotics and Artificial Intelligence
European Parliament’s Committee on Legal Affairs

RPAS/UAS Challenges in ATM

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15 July 2015
EUROCONTROL UAS activities

- Monitoring UAS developments (since 1999)
- EUROCONTROL Specifications for the Use of Military UAVs as Operational Air Traffic Outside Segregated Airspace (2007)
- ATC simulation for an operational assessment of the integration of UAS into the ATM network (2008)
- EUROCONTROL Global Hawk guidelines (2010)
- EUROCONTROL UAS C3 Channel Saturation Study (2010)
EUROCONTROL participation in UAS fora

- EUROCAE (European Organisation for Civil Aviation Equipment) Work Groups 73 and 93
- ICAO UAS Study Group (UAS SG) (2008 to 2014)
  - Chaired by EUROCONTROL (2008 to 2011)
  - Leadership of “Annex 2 (Rules of the Air) and ATM (Air Traffic Management)” working group
- ICAO RPAS Panel (since November 2014)
  - Chairmanship of “C2 (Command and Control)” and “ATM” working groups
- JARUS (Joint Authorities for Rulemaking on Unmanned Systems)
  - EUROCONTROL provides the Secretary General and manages the Secretariat
- ERSG (European RPAS Steering Group)
  - composed of European Commission (EC), EASA, EUROCONTROL, SESAR JU, JARUS, industry, chaired by EC
ATM challenges of RPAS integration

- Integration of remotely piloted UA into non-segregated airspace
  - Safety risks
  - Security risks
  - System reliability
  - Airspace capacity
  - Frequency Spectrum
  - Equipage requirements
  - Communications (use of SATCOM)
  - Minimum performance requirements
  - Contingency/flight termination planning
  - Human factors/training
  - Acceptance by manned aviation community and ATC
Regulatory framework for UAS

- **Global**
  - ICAO (International Civil Aviation Organisation)
    - Development of regulatory framework at a global level
    - Standards and Recommended Practices (SARPs), Procedures for Air Navigation Services (PANS)
    - Guidance material, Manual on Remotely Piloted Aircraft Systems (RPAS)

- **Regional**
  - For example: EU/EASA
    - Airworthiness certification
    - Development of common EU rules for operations and flight crews

- **National (examples)**
  - US: policy, FAA Order
  - UK: CAA UAS Policy and guidance document
  - Australia: CASA Regulations and advisory circulars
Unmanned aircraft – ICAO classification and definitions

- **UAV** = unmanned aerial vehicles
- **UA** = unmanned aircraft
  “An aircraft which is intended to be operated with no pilot on board shall be further classified as unmanned” (ICAO Annex 7)
- **UAS** = unmanned aircraft systems
  Not defined
- **RPA** = remotely piloted aircraft
  “An unmanned aircraft which is piloted from a remote pilot station” (ICAO Annex 2)
- **RPAS** = remotely piloted aircraft systems
  “A remotely piloted aircraft, its associated remote pilot station(s), the required command and control links and any other components as specified in the type design” (ICAO Annex 2)
- **RPS** = remote pilot station
  “The component of the remotely piloted aircraft system containing the equipment used to pilot the remotely piloted aircraft” (ICAO Annex 2)
Unmanned aircraft – segmentation by ICAO
ICAO – current scope and focus

Scope
- Civil RPAS
- Autonomous aircraft currently not addressed
- RPAS engaged in international air traffic
- RPAS operating in accordance with IFR (Instrument Flight Rules)
- RPAS operating in controlled airspace and at controlled aerodromes

Assumptions
- Only remotely-piloted aircraft (RPA) will be able to integrate into the international civil aviation system in the foreseeable future
- Model aircraft are exclusively the subject of national regulations
- Unmanned aircraft (UA) = aircraft
- RPA will not, in the foreseeable future, have passengers on board for remuneration
- Regulatory framework for manned aircraft for a great portion directly applicable to RPAS
- RPAS-specific SARPS needed in addition
ICAO – regulatory challenges

- Amendments to ICAO Standards and Recommended Practices (SARPs)
  - Annex 1 Personnel licensing
  - Annex 6 Operation of Aircraft
  - Annex 8 Airworthiness of Aircraft
  - Annex 2 Rules of the Air
  - Gap analysis of Annexes 11 (Air Traffic Services) and 12 (Search and Rescue)
- Amendments to Procedures for Air Navigation Services (PANS)
- Phraseology
European Union – UAS regulatory challenges

- Transposition into SERA of amendments to ICAO Annex 2 (Rules of the Air) and its new Appendix 4 (Remotely Piloted Aircraft Systems)
- Protection of the citizen (privacy, security)
- Equipment requirements
- Certification of UAS
- Licensing and Competencies
- Traceability of UA (registration and identification marks)
States - regulatory challenges

- State aircraft
- Model aircraft, identified by many States as those used for recreational purposes only
- Small aircraft (< 150 kg)
- VLOS (Visual Line of Sight) and VLL (Very Low Level) operations
Current Status Civ UAS Regulation in Europe per State

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Thank you for your attention

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