Unmanned Aircraft System (UAS): regulatory framework and challenges

NAM/CAR/SAM
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Overview

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- Objective
- UAV?
- Assumptions
- Challenges
- Regulatory Framework
- UAS in ATM System
- Emerging Situational Technologies
- Recommendations
Background
Can an UAS operate in controlled airspace?

Which technologies can be used to reduce the impact?

UAS in civil applications

Improve the regulations for UAS operations
“[A]n unmanned aerial vehicle is a pilotless aircraft, in the sense of Article 8 of the Convention on International Civil Aviation, which is flown without a pilot-in-command on-board and is either remotely and fully controlled from another place (ground, another aircraft, space) or programmed and fully autonomous.”
Objective

- This presentation provides an overview of the regulatory frameworks for the UAS activities and how to ensure safe operations in the ATS system.

- It also addresses regional coordination between States and other stakeholders for UAS operations during natural disaster events.

- It explains future challenges of the UAS into the ATM system.
Assumptions

- UAS is another user of the airspace
- The ATM should be able to allow the UAS operations
- The activities should include both civil and military air operations
- The first step is regulatory framework for the UAS in order to ensure safety integrated operations into the ATM system
- States to disseminate ATS procedures for UAS air operations
UAVs applications

- Demand of RPAS for Military & civil operations
- International Military operations
- SAR, Coastguard / coastline and sea-lane monitoring
- Fire Services and Forestry Fire detection, incident control
- Owners / operators of model aircraft doing to commercial activity
- Many non-aviation businesses and entities importing RPAS
- Aerial photography, Film, video, still, etc.
- Agriculture Crop monitoring and spraying
- Conservation, Pollution and land monitoring
- Electricity companies, Power, line inspection
• Support the evolution of RPAS for airspace operations.

• Ensure industry development and evolution.

• Determine Class / Category on a case-by-case basis
  - Below 150kg as a starting point
  - size, weight, complexity, human factors, airspace requirements, & operational characteristics

• Publication of regulatory framework

• Full member participant
Can an UAV operate in the ATS airspace?

Challenges

Regulatory

Technological

Safety
Chicago Convention

✓ Article 3 bis - States to exercise its sovereignty
✓ Article 8 - Pilotless Aircraft
✓ Article 12 - Rules of the Air
✓ Article 15 - Airport and similar charges
✓ Article 29 - Documents carried in aircraft
✓ Article 31 - Certificates of airworthiness
✓ Article 32 - Licenses of personnel
✓ Article 33 - Recognition of certificates and licenses
Guidance based on the Chicago Convention
Same standards as manned aircraft
Application of ICAO 19 Annexes requirements
Safety Management
Remotely-Piloted Aircraft System (RPAS): set of configurable elements
  - associated remote pilot station(s)
  - C2 links
  - software
  - health monitoring
  - ATC communications equipment
  - a flight termination system
  - launch and recovery elements.
RPAS operations: in ATS airspace subject to authorization
Segregated airspace established by AIP and /or NOTAM
  - Restricted
  - Experimental
  - Special flights
Although the pilot of a UAV operated outside a militarily hostile environment must maintain A/G communication with the relevant ATC units and obtain appropriate clearances to operate.

The Regulatory Requirements for UAV are exactly the same “Rules of the Air” as manned aircraft.

This includes a requirement to ‘see and avoid’ other air operations.
UAV in the ATM system

Can technologies act as a part of the solution?
Air Traffic Management & Frequency
Spectrum allocation

ATM regulations and procedures
  i. Rules of the Air
  ii. Air-to-ground communication between ATS/ATC and RPAs
  iii. Ensure communication between RPAS pilot and ATS/ATC station
  iv. Timely training for ATS/ATC Personnel
Why technologies?

- UAVs operate in combined civil and military airports

- Most of airports share the same airport infrastructure

- The UAVs will follow the ATS routes and execute approach procedures?
Emerging situational awareness technologies

- ACAS / TCAS
- ASAS
- ADS-B
Emerging Technologies to reduce the impact

- Which technologies can be used to reduce the impact?

- An UAV can be equipped with a TCAS?

  - The RA would be sent to the remote pilot in order to execute the requested maneuver or to other flights as done currently.
Emerging technologies

**Airborne Separation Assistance System (ASAS)**

Airborne Surveillance (AS) applications facilitate situation awareness to air operators as well as to ground operators.

- An UAS based on airborne surveillance that provides assistance to the remote pilot supporting the separation of their UAS from other aircraft, monitoring and controlling aircraft separation.

- ASAS provides information to the cockpit (or RP) about the position of surrounding traffic.

- In the future this may enable the UAS remote pilot to take over some of the separation tasks of air traffic controllers.
Airborne Separation Assistance System (ASAS)

ASAS pages on MCDU for data input
Existing Technologies ...

- ADS-B can be a solution

The UAS could broadcast its position to the other aircrafts and to the ATC.
Conclusion

UAS (unmanned aircraft system) is a reality and its complete adaptation to the ATM system will depend on us....

ATM system should be prepared!
Recommendations

- Regulatory framework for UAS in combined civil and military air operations

- Ensure airports infrastructure when sharing the same airport

- To follow UAS developments and execute the ATS routes and procedures, as applicable

- Safety Management