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Sharing the airspace with unmanned vehicles

Should we fear stricter rules?

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Role of States

- Control and manage their own airspace (Chicago Convention)
 - Airspace use requires permission
 - By extension, all other aviation activities require State *clearance*
- Progressive reduction of operational role, but continue to:
 - Grant commercial traffic rights
 - Control airline ownership
 - Supervise safety and security
 - Impose environmental regulations



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The International Civil Aviation Organization (ICAO)



www.icao.int

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ICAO

- Established by the Chicago Convention, 1944
- Recognized as **THE** United Nations body in charge of Civil Aviation
- Organization of sovereign States: 191 members
 - How many States are not ICAO members ?
- Classical UN structure
 - Assembly, Council, Air Navigation Commission
 - Committees, Panels, Conferences
 - Secretariat of 800 staff members at HQs in Montreal and in 7 regional offices
 - Paris, Bangkok, Cairo, Nairobi, Dakar, Mexico and Lima

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ICAO's role

- Harmonization of all technical rules through Standards & recommended Practices (SARPs), procedures & guidance material
- Creation of global and regional air navigation plans
- Definition of global policies regarding priority issues
 - Safety
 - Security
 - Environment
- Adoption of Conventions on international air law

THE ICAO ANNEXES

Annex 1 Personnel Licensing

Annex 2 Rules of the Air

Annex 3 Meteorological Service for International Air Navigation

Annex 4 Aeronautical Charts

Annex 5 Units of Measurement to be Used in Air and Ground Operations

Annex 6 Part I – III Operation of Aircraft

Annex 7 Aircraft Nationality and Registration Marks

Annex 8 Airworthiness of Aircraft

Annex 9 Facilitation

Annex 10 Volume I – V
Aeronautical Telecommunications

Annex 11 Air Traffic Services

Annex 12 Search and Rescue

Annex 13 Aircraft Accident and Incident Investigation

Annex 14 Volume I + II
Aerodrome Design and Construction

Annex 15 Aeronautical Information Services

Annex 16 Environmental Protection

Annex 17 Security

Annex 18 The Safe Transport of Dangerous Goods by Air

Annex 19 Safety Management

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Convention on International Civil Aviation

Article 8

Pilotless aircraft

No aircraft capable of being flown without a pilot shall be flown without a pilot over the territory of a contracting State without special authorization by that State and in accordance with the terms of such authorization. Each contracting State undertakes to insure that the flight of such aircraft without a pilot in regions open to civil aircraft shall be so controlled as to obviate danger to civil aircraft.

Doc 7300/9 - 2006

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› ICAO Annex 1 Personnel Licensing

*A person shall not act as a flight crew member of an aircraft unless a **valid licence is held** showing **compliance with the specifications** of this Annex and **appropriate to the duties to be performed by that person.***

› ICAO Annex 2 Rules of the Air

*Nothing in these rules shall relieve the pilot-in-command of an aircraft from the responsibility of taking such action, including collision avoidance manoeuvres based on resolution advisories provided by ACAS equipment, as will best **avert collision.***

*An aircraft **shall not be operated in such proximity to other aircraft as to create a collision hazard.***

Appendix 4 Remotely Piloted Aircraft Systems

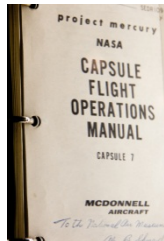
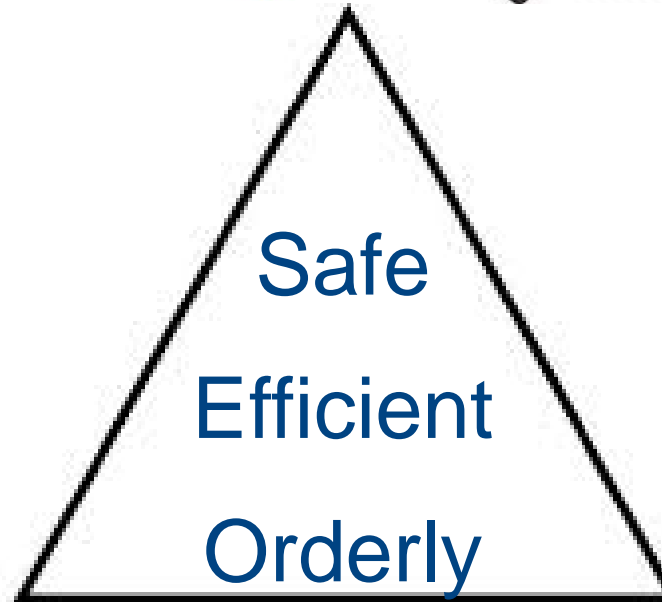
Note 2.— Certification and licensing Standards are not yet developed. Thus, in the meantime, any certification and licensing need not be automatically deemed to comply with the SARPs of the related Annexes, including Annexes 1, 6 and 8, until such time as the related RPAS SARPs are developed.

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› ICAO Annex 8 Airworthiness of Aircraft

*The design aspects of the appropriate **airworthiness requirements**, used by a Contracting State for **type certification** in respect of a class of aircraft or for any change to such type certification, shall be such that compliance with them will ensure compliance with the Standards of Part II of this Annex and, where applicable, with the Standards of Parts III, IV, V, VI or VII of this Annex.*

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Conclusion:

- › *No adequate regulation for **Training and Licencing** for RPAS operator*
- › *No adequate requirements for **Airworthiness** of RPAS*
- › *No adequate **procedures** for Flight Operations (and Air Traffic Services) for RPAS*

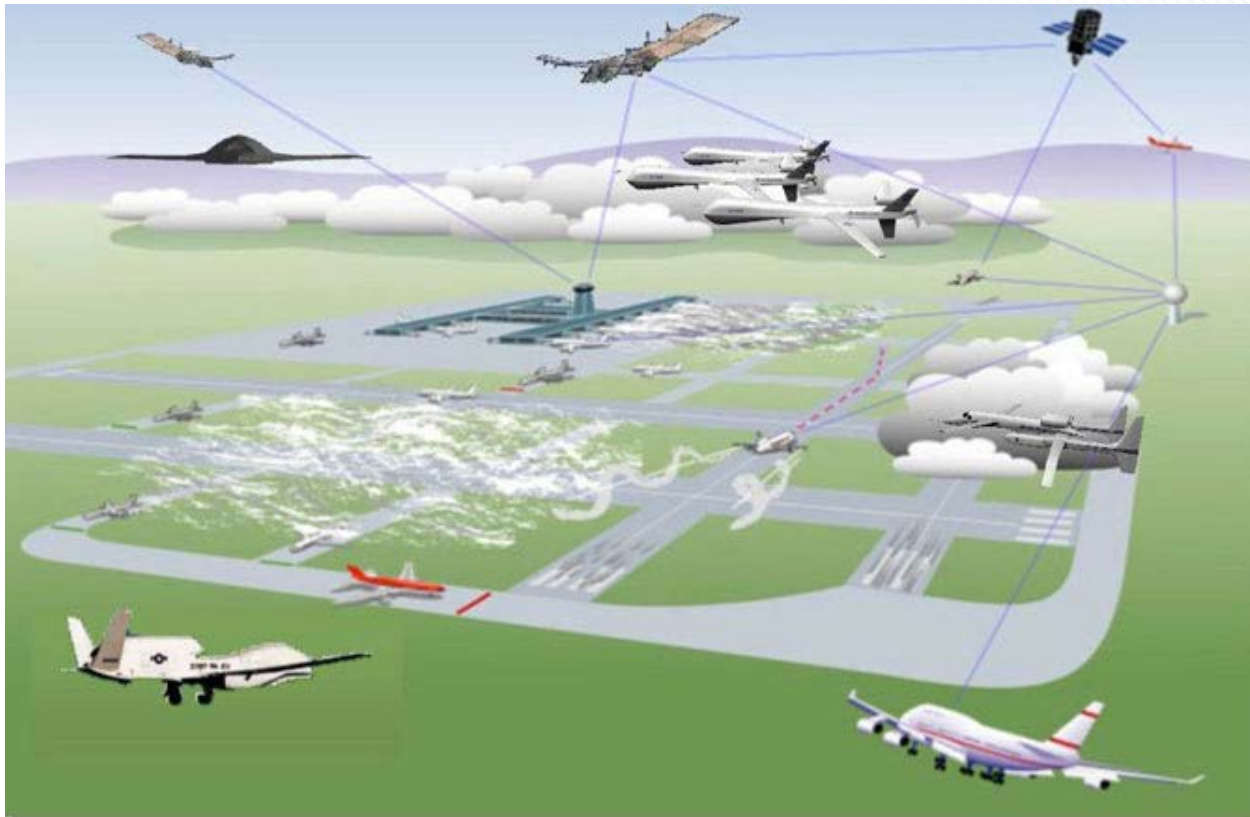
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- › Operation of RPAS beyond a direct line of sight (human eye) between operator and Unmanned Aircraft only in segregated (reserved) airspace and with permission from the State (Federal Office of Civil Aviation)

(Art. 17ff, Verordnung über die Luftfahrzeuge besonderer Kategorien, VLK, SR 748.941)

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› The ATM Perspective



Picture: NASA

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› Air Traffic Market Outlook 2012 - 2032

Airplanes in service 2012 and 2032			Demand by size 2013 to 2032		
Size	2012	2032	Size	New airplanes	Value (\$B)
Large widebody	780	910	Large widebody	760	280
Medium widebody	1,520	3,610	Medium widebody	3,300	1,090
Small widebody	2,310	5,410	Small widebody	4,530	1,100
Single aisle	13,040	29,130	Single aisle	24,670	2,290
Regional jets	2,660	2,180	Regional jets	2,020	80
Total	20,310	41,240	Total	35,280	4,840

*\$ values throughout the CMO are catalog prices.

Current Market Outlook
2013-2032



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Should we fear stricter rules?

Challenges for the Future

Access to infrastructure:

Airports

Airspace

ATM capacity

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