UK ATM and UAS Operations

RAeS London – 19-20 September 2012

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Aerodromes and Air Traffic Standards
Scope

• **Where are we at the moment in the UK?**
  - Basic principles/Current regulatory environment

• **What does the UK UAS industry ‘look like’?**
  - Aircraft types/Companies/Uses

• **What influence does the UK CAA have?**
  - Where and how is UK involved

• **Practical interaction between Remote Pilot and ATC.**
  - What would really annoy an Air Traffic Controller!!!!
Where are we in the UK at the moment?
Fundamental Principles

- They are Aircraft – not ‘drones’ ‘toys’ ‘UAVs’ etc
- They are Piloted/not Autonomous
- Equivalence – to manned aviation (level of compliance)
- No ‘automatic rights’ - to airspace or special privileges
- Transparency – to ATC, preferably no special rules
- Operate within the bounds of existing legislation
- Safe to Fly and Flown Safely
ANO 2009 - Key Articles

• **138 – Endangerment**
  • ‘Person shall not recklessly or negligently permit an aircraft to endanger persons or property’

• **166 – Small Unmanned Aircraft** (20kg or less)
  • Don’t drop anything/fly safely/maintain unaided visual contact
  • >7kg ATC permission for A,C,D,E airspace, ATZ’s, >400ft.
  • Aerial work must have CAA permission.

• **167 – Small Unmanned Surveillance Aircraft**
  • ‘SUSA’ is a small unmanned aircraft equipped to undertake surveillance or data acquisition.
  • Unless authorised not fly over or within 150m of congested area or assembly of >1000 people or 50m of any person unless under ‘pilot control’. 30m for landing and take off.
Main Changes –
- Revised abbreviations, glossary, terminology
- New Human Factors chapter
- Revised civil operations ‘Approval to Operate’ chapter
- Amendments to civil incident/accident procedures
- Revision of section 4 military operations
# Current UK Requirements

<table>
<thead>
<tr>
<th>Aircraft Mass</th>
<th>Airworthiness Approval?</th>
<th>Registration?</th>
<th>Operating Permission?</th>
<th>Pilot qualification</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 20 kg</td>
<td>No</td>
<td>No</td>
<td>Yes (Note 1)</td>
<td>Yes (Note 1) BNUC-S™ or equivalent (Note 2)</td>
</tr>
<tr>
<td>20 kg - 150 kg</td>
<td>Yes (Note 3)</td>
<td>Yes (Note 3)</td>
<td>Yes</td>
<td>Yes, BNUC™ or equivalent (Note 2)</td>
</tr>
<tr>
<td>&gt; 150 kg</td>
<td>EASA or UK PtoFly</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, BNUC™, CPL(A) or equivalent (Note 2)</td>
</tr>
</tbody>
</table>

**Notes:**
1) Applicable for aircraft used for Aerial Work purposes or if flown within a congested area or close to people or property. (Aerial work = valuable consideration is given or promised in respect of the flight)
2) Equivalent pilot experience will be considered on a case-by-case basis during application for an operating permission.
3) It may be possible to obtain certain exemptions from the airworthiness and registration requirements
What does UK Industry look like?
The Current Situation
• Currently approximately 130 Companies/Uni’s/Individuals
• 75% are rotary wing
• 23% fixed wing
• 2% seaplane/airship
• 75% are electrically powered
• 25% turbine, jet, piston
• 31% are 2kg or less
• 67% are 7kg or less
• 95% are 20kg or less
• 5% more than 20kg
Rotary Wing UA
Fixed Wing UA
Project URSULA
UAS Ops Within UK Airspace

• **Visual Line of Sight (VLOS)**
  - ‘See and Avoid’ responsibilities through visual observation (visually managed)
  - Limited range- Size/Colour, weather conditions
  - 400ft vertical, 500m horizontal – basic limits
  - Extended VLOS (currently 2 companies granted this option)

• **Beyond Visual Line of Sight (BVLOS)**
  - Detect/Sense and Avoid System
  - Segregated Airspace (if no D&A system fitted)
UAS Segregation

- UK uses Danger Areas as prime tool for UA segregation purposes
  - UA flight not considered inherently dangerous
  - Activity demands an enhanced level of protection both to, and from, other airspace users
- Short term needs may be catered for through temporary airspace restrictions – TDA
- Segregation denies airspace to other users – not sustainable.
West Wales UAV Centre - Parc Aberporth
Wilts/Salisbury – EGD120, 122 A/B/C
Next Steps Toward Integration?

- **Step-by-Step expansion of operations:**
  - Visual Line of Sight – below 400 ft / 500m range
  - Extended Visual Line of Sight
  - In segregated airspace over sterile surface
  - In segregated airspace – surface may be populated
  - In segregated - ‘managed’ interaction with manned aircraft
  - In airspace with very low traffic densities/populations (remote, over water)
  - Airspace and overflight as for manned aircraft
What influence does the UK CAA have?
The Regulatory Environment

- JARUS
- ASTRAEA
- RAeS
UK AIRSPACE – A Busy Environment
Issues for ATC

• Flight planning, predictability, expectation.
• Class of airspace, IFR vs VFR, flight priority, how busy is the airspace?
• Conspicuity - radar coverage primary/secondary.
• RTF – coverage, latency, pilot competence.
• Autonomy vs pilot control.
• Class G operations, see and avoid, ATSOCAS, unknown traffic environment.
• Link loss and emergencies
Detect What?
The Future?
Conclusions

- As for manned aircraft, unmanned aircraft will only be permitted to operate in UK airspace if it is considered that it is safe for them to do so – ‘Safe to be Flown and Flown Safely’. We are developing appropriate regulation.

- In the UK today we have a growing and diverse civil UA industry with many SME’s involved using small rotary and fixed wing aircraft largely > 20kg using VLOS.

- UK CAA has considerable influence and input to a wide range of regulatory bodies developing UA requirements.

- UK airspace is a challenging environment, VLOS below 400ft should not encounter many other aircraft, but D&A a must for full airspace integration, Class G a challenge. Step by step approach to the future.
Thank You

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