Accommodating Sub-orbital and Orbital Aircraft (SOA) flights in the EU

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Briefings to the ICAO Air Navigation Commission (ANC) and ICAO Council
Monday 21st of October 2013, Montreal
How to allow Sub-Orbital and Orbital Aircraft to fly in the EU...
...to prepare for the next generation of aircraft
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I. The institutional and legal framework
European Union and EFTA countries

28 EU states

4 EFTA states
EASA competence: for *aircraft*

- Aircraft definition in ICAO Ann. 2, 6 & 8:
  - “Any machine that can **derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth’s surface**”

- Machines able to fly in the atmosphere sustained by wings are *aircraft*
- **Aircraft** include: Aeroplanes (fixed wings), Rotorcraft (rotating wings) and Balloons (incl. Stratospheric Balloons)
- **Vertical Take Off and Landing (VTOL)** vehicles need to be addressed
- **Rockets** are in the competence of Member States

- *(EU)216/2008 (EASA “Basic Regulation”) Article 1:*
  - Aircraft under EASA scope **need to be certified** for their design, production, maintenance and operations, as well as the personnel and organisations in charge of those.
All *aircraft* are in the EASA competence except...

- those listed in **Annex II** of the Basic Regulation:
  - Historic aircraft
  - Research, experimental or scientific aircraft
  - Amateur built aircraft
  - FORMER MILITARY AIRCRAFT
  - « light » aircraft
    - e.g. MTOM < 450 Kg for a two-seater aeroplane
  - Replicas

- and those used for **State** missions
  - e.g. Police, Rescue, Military, etc...
II. Challenges
Challenges in the application of the common (safety) rules on civil aviation

Airworthiness

- Certification? (R)TC; (R)CofA
- Certification basis? CS-23/CS-25/CS-E plus special conditions
- Where impossible to comply: demonstration of an equivalent level of safety
- All organisations and personnel involved (design, production, maintenance) need approval

Existing Aviation Certification Process

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To be set
Challenges in the application of the common (safety) rules on civil aviation

- Operations
  - AOC for commercial operations
  - Authorisation of 3rd country operators

- Personnel Licensing (and passenger safety)
  - Pilots licensed (CPL/ATPL)

- Passenger safety

- Aerodromes and ATM/ANS
Passengers (PAX) impact on SOA Flight Safety:

**Detrimental 😞:**
- **Medical condition** may require **aborted flight/premature return:**
  - Off-nominal procedures = Crew workload \(^{\uparrow}\) = Hazard level \(^{\uparrow}\)
- **Physical impairments** may jeopardize Emergency Procedures
- **Abnormal behaviours** may impact safety and/or Emergency Procedures
- **Release of Fluids in single cabin** may impair Crew Capabilities
- **Unsecured Floating Mass** in case of LoC* during free floating phase

**Instrumental 😊:**
- Accomplish **simple and trained nominal procedures**
- Perform **Buddy-Checks** during flight and report to Crew
- **Handle/Secure Incapacitated Passenger** back to Seat before re-entry
- Accomplish/Assist Crew in **simple and trained Emergency procedures**
- Accomplish/Assist Crew in simple **Basic First Aid and Survival**(ground)

*LoC: Loss of Consciousness
III. Status and Proposed Approaches
EASA is in touch with most EU stakeholders and US developers since 2007

As requested by Stakeholders and the EC*, EASA has been working on possible approaches

8 Options have been proposed to the EC* for decision and presented to stakeholders via several media (publications, review of papers, conferences, workshops, direct contacts...)

*European Commission decision is pending
0. Member States Regulate:
   • MS to develop own regulations: no harmonisation, no interoperability, legal framework TBD
   • MS/EU to ensure compatibility with EU/Aviation laws

1. Member States with EASA involvement:
   • EASA cooperates with MS to ensure safety/environment and foster harmonisation

2. Association of States “JARSOA” (similar to JARUS):
   • International, with EASA participation
   • Rules to be implemented at National Level

3. EU Policy for SOA (similar to UAS):
   • Guidance to MS, Designers, Manufacturers and Operators
   • No legal framework
4. “Light” Process
   - Essential Requirements only
   - National Implementing Rules and Technical requirements
   - No full harmonisation, responsibility with MS

5. Full set of Rules for SoA
   - Following EASA established rules and processes
   - With provisions for High Altitude/High Speed Transportation Aircraft (HST)

6. Phased approach (e.g: 1+2+3+4+5)
   - Progressive implementation along with projects development
   - Full set of rules published at maturity

7. Full set of Rules for Sub-orbital, Orbital and HST
   - Covering full spectrum from Ground to Orbit and A-B
   - Long and comprehensive process (~10 years)
IV. Proposed Regulatory Framework
Proposed Cooperative Framework (1/2)

- Under the frame of ICAO/UNCOPUOS
  - ICAO Concept of Sub-orbital flights C-WP/12436 of 2005
    - Letter to UNCOPUOS 17 March 2010
  - ICAO Aerospace Working Group
    - Conference Room Paper A/AC.105/C.2/2010/CRP.9
    - Briefing to ANC+Council 21 October 2013
    - Roadmap TBD

- In full coordination with
  - European Commission
  - EU-Member States

- In cooperation with FAA (−AVS and −AST)
Proposed Cooperative Framework (2/2)

» On Essential Requirements (ERs)
  » Based on ICAO Annexes, Circulars, Manuals and SARPS (to be adapted/developed)
  » Complementing EASA Basic Regulation ERs
  » *Could be also based on FAA 14 CFR.400 series*

» On Technical/Operational Requirements
  » Based on respective projects
  » Following a CS+AMC/GM structure
  » Taking into account existing Standards:
    » FAA-AST/COE-CST, ESA/NASA, ECSS, IAASS, etc...
VI. Conclusions
Conclusions (1/3)

- EASA has studied and submitted several options to the Commission to **allow SOA flights in the EU**

- EASA may receive soon applications for the **certification of SOA + Rocket Engines projects and their operations**

- This shall allow **new technological developments and their operations** to pave the way for next generation aircraft
An EU-framework exist for aviation

Existing Aviation Rulemaking, Certification, Standardisation **processes** could be profitably used

**Regulations** should be based on *aerospace* Laws, Regulations, Standards, Best Practices and Experience

**Option** to be decided soon by European Commission (EC)
Because of limited resources and other higher priorities, EASA is evaluating the ways to cooperate with ICAO/UNCOPUOS, FAA, NAAs, NSAs, Standardisation Bodies and all Stakeholders to ensure a safe and international regulatory framework for Sub-orbital and Orbital Aircraft (SOA) Flights

*Time is NOW to be ready by tomorrow!*
Thank you for your attention!

Questions?
Thank you for your attention

Do not hesitate to contact us for any further information

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