



The European Organisation for Civil Aviation Equipment
L'Organisation Européenne pour l'Équipement de l'Aviation Civile

WORKING GROUP 73 UNMANNED AIRCRAFT SYSTEMS

Short introduction and status

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Based on inputs from Ron van de Leijgraaf, Dan
Hawkes, and other members of EUROCAE WG-73

About EUROCAE

- ❑ Established in 1963 as a European technical forum for administrations, airlines and industry.
- ❑ Prepares minimum performance specifications for airborne electronic equipment as a basis for EASA Technical Standard Orders (ETSO).
- ❑ Activities now extended to include complex CNS/ATM* systems including their ground segment.
- ❑ EUROCAE:
 - Is recognised by the European Commission as the unique body competent for the standardisation and interoperability required for the Single European Sky concept; and
 - Is acknowledged by ICAO which references its documents.



EUROCAE and UAS

- ❑ EASA has requested EUROCAE to draft regulations for those unmanned aircraft with max takeoff mass > 150kg, where EASA is regulator, in accordance with EC directive 1592/2002 and later EC directive 216/2008.
- ❑ Unmanned Aircraft lighter than 150kg is national CAA responsibility, Ref EC directive 216/2008, Annex 2.
- ❑ EUROCAE has undertaken to provide draft regulation basis also for light unmanned aircraft (<150kg) to promote harmonization between European countries.
- ❑ EUROCAE is also coordinating with RTCA (SC 203)

EUROCAE Working Group 73

- ❑ EUROCAE WG-73 was launched in April 2006 following earlier work by EUROCONTROL, NATO, and JAA.
- ❑ WG-73 participates in the ICAO UAS Study Group.
- ❑ WG-73 cooperates with other bodies dealing with UAS.

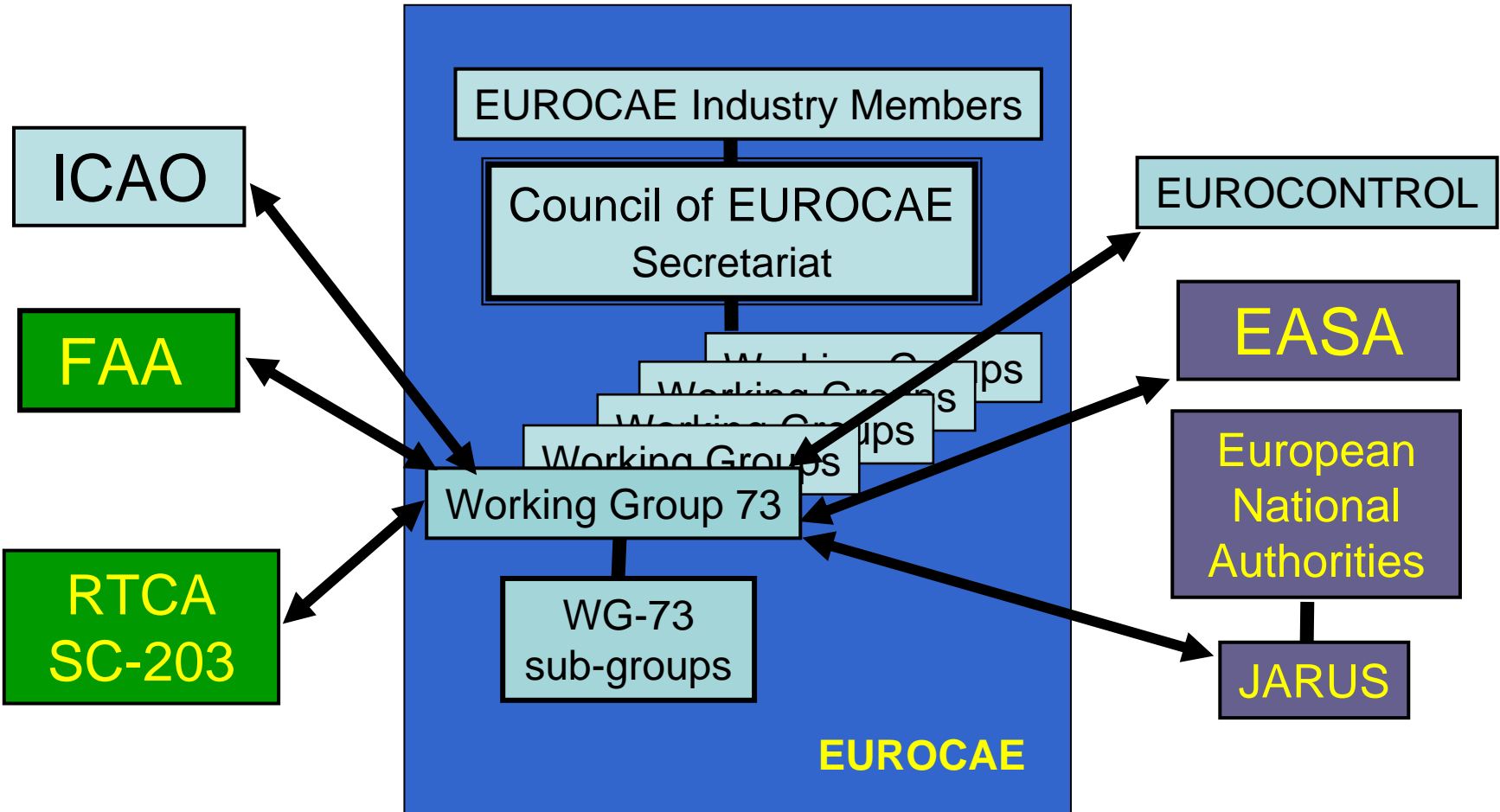


European Aviation Safety Agency



UAS 2009

Primary Civil Aviation WG-73 Partners



EUROCAE WG-73 Objectives

- ❑ **Requirements framework** that will support civilian UAS **airworthiness** certification and **operational** approvals.
- ❑ **Safe operation within non-segregated airspace** in a manner compatible with other airspace users
- ❑ **Compatibility with the existing ATM** regulatory framework; Investigation of **longer term ATM adaptations**

Key Players

Chairman: Daniel Hawkes [EUROCAE] – will retire from WG73 31.12.2009
Vice Chairman: Gérard Mardiné [SAGEM] – acting chairman from 01.01.2010
Vice Chairman: James Sizemore [FAA]
Secretary: Dewar Donnithorne-Tait [AUVSI]
EASA: Filippo Tomasello, David Haddon
ATM: Holger Matthiesen [EUROCONTROL]
ICAO UASSG: Tony Henley [BAE Systems]
RTCA SC-203: Ken Geiselhart [Lockheed Martin]
Standing Advisor: Peter van Blyenburgh [UVSI]

**Subgroup #1:
UAS Operations &
Sense and Avoid**

**Gérard Mardiné
SAGEM**

**Subgroup #2:
Airworthiness &
Continued
Airworthiness**

**Michael Allouche
IAI**

**Subgroup #3:
Command and Control,
Communications,
Spectrum, & Security**

**Norbert Tränapp
IABG**

**Subgroup #4:
UAS <150kg for
VLSO**

**Ron van de Leijgraaf
CAA NL**

WG-73 Current Focus

- ❑ The terms of Reference for WG-73 include tasks to support development of **operational approval** and **airworthiness certification** requirements.
- ❑ The current WG-73 focus is production of *Deliverable 3*, a “Concept Document” in **five volumes** intended to assist development of a regulatory framework for civilian UAS.
- ❑ Deliverable 3 can be identified as EUROCAE Report ER-004 *Unmanned Aircraft Systems*

Volume 1
General Considerations for
Civilian Operation of
Unmanned Aircraft

Volume 2
UAS Operations

Volume 3
UAS Airworthiness
Certification

Volume 4
UAS for VLOS Operations

Volume 5
Command & Control
Considerations for UAS

WG-73 Future Deliverables

Deliverable 3

A Concept for UAS Airworthiness Certification and Operational Approval in the Context of Non-segregated Airspace.

Issue 1: December 2009

Deliverable 4

MASPS* for UAS Communication, Command & Control Systems.

Preliminary Issue: December 2010

Deliverable 5

MASPS* for UAS Sense and Avoid Systems.

Issue 1: December 2012

The Terms of Reference for RTCA SC203 identify equivalent products to these WG-73 deliverables.

* *Minimum Aviation System Performance Standards*



SG4: UAS for Visual Line of Sight Ops

SG 4: UAS Visual Line of Sight Operations

Brief history

Current status

Future activities

Brief history of SG4

- ❑ Initially no specific focus on Light UAS (< 150 kg) in WG-73
- ❑ Great market pull for Light UAS is forecast
- ❑ A need for a dedicated group to cater this fast growing market was identified
- ❑ Small precursory group defined tasks to be performed
- ❑ SG 4 was proposed and accepted within WG-73
- ❑ The intent was to provide basis for permission for commercial UAS operations in limited amount of airspace, within the shortest possible timeframe

Note: During the work the 150kg limit was removed and the Visual Line of Sight limitation included

Brief history of SG4 /2

- ❑ Initial task of SG4:
 - collect and review existing material
 - draft guidelines and recommendations
- ❑ CAA UK regulation on Light UAS, CAP 722, was selected as basis for development of a generic recommendation for regulation
- ❑ Initial draft of “European” deliverable established
- ❑ Several iterations of comments, draft updates, and subgroup meetings

Core contents of recommendation

□ Operational classification of three classes of VLOS airspace

VLOS Classification	Environment	Constraints	Proposed Regulatory Principles
VLOS Class 1	<p>Non-segregated airspace.</p> <p>Day/VFR only.</p> <p>Not above or within 150m of any person, building vessel or vehicle.</p>	<p>Within visual range radius of UAS-pilot and with altitude and speed limits consistent with visual range value.</p> <p>If no other justification is given, default to maximum of 500m lateral radius, 400ft (150m) above surface and 70kts level speed.</p>	<p>No formal airworthiness certification. Approval to operate based on technical assessment of construction and systems and demonstration/test flights to show correct operation and crew competence.</p> <p>There may be a minimum mass or Kinetic Energy of aircraft below which no assessment is necessary.</p> <p>Permission of local ATC unit will be required if operation is within an active Air Traffic Zone</p>

Core contents of recommendation /2

VLOS Classification	Environment	Constraints	Proposed Regulatory Principles
VLOS Class 2	<p>Non-segregated or segregated airspace.</p> <p>Day/VFR only.</p> <p>Above or closer than 150m to any person, building vessel or vehicle.</p>	<p>Within visual range radius of UAS-pilot and with altitude and speed limits consistent with visual range value.</p> <p>(If no other justification is given default to maximum of 500m lateral radius, 400ft (150m) above surface and 70kts level speed).</p>	<p>Formal regulation:</p> <p>Full set of Regulations</p> <p>C of A</p> <p>Pilot license</p> <p>Type Certification</p> <p>Maint. Org. Appr. - Part 145,</p> <p>Prod. Org. Appr. - Part 21G,</p> <p>Design Org. Appr. - Part 21J</p> <p>Or, apply other mitigations, such as using personnel to prevent public access to the operating area.</p> <p>Permission of local ATC unit will be required if operation is within an active Air Traffic Zone</p>

Core contents of recommendation /3

VLOS Classification	Environment	Constraints	Proposed Regulatory Principles
VLOS Class 3	<p>Segregated airspace only.</p> <p>Day/VFR only.</p> <p>Not above or within 150m of any person, building vessel or vehicle.</p>	<p>Distance, altitude and speed limits that are consistent with remaining within the segregated airspace (with a margin for potential system failures and crew errors).</p>	<p>No formal airworthiness certification.</p> <p>Approval to operate based on technical assessment of construction and systems and demonstration/test flights to show that the aircraft can be prevented from leaving the segregated airspace, or reaching persons, vehicles, vessels or buildings.</p> <p>Co-ordination with ATC unit required in case of incursions by other aircraft or UAS excursion beyond the segregated airspace.</p>

Plenary Meeting #11, conclusions:

- ❑ EUROCONTROL is concerned about the safety of VLOS use for separation of multiple aircraft in the same airspace
 - Agreed to include text to limit access to airspace within VLOS to 1 operator with one or more UAS and to start research into VLOS applicability for aircraft separation
- ❑ Document not clearly enough in line with CAA UK CAP 722
 - The range, mass, and energy limits adopted from the JAA / EUROCONTROL Task Force and UK CAP722 will be retained
- ❑ Lack of weight sub-classification below 150 kgs
 - Text will be updated to more clearly reflect the CAP 722 policy, including the weight subclassification
- ❑ Several other comments will be answered in comment response document

SG4 Further Work

- ❑ Peter Cosyn of Gatewing will draft a proposal for an 'inherently harmless' class of UAS.
 - To be discussed at the next meeting
- ❑ Andrew Tailby of Qinetiq will draft a proposal to extend the VLOS applicability
 - To be discussed at the next meeting

Schedule finalising deliverable

- ❑ Next version of Volume 4
 - End January 2010
- ❑ Consultation within SG4
 - Mid February 2010
- ❑ Recommendation to Plenary Meeting #12
 - 9.-10. March 2010



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Civil Aviation Equipment**

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Thank you for your attention!

The information in this presentation references draft material for use by EUROCAE WG-73 and should not be regarded as statements of EUROCAE policy unless approved by the EUROCAE Council.

This presentation was compiled by Per Osen on behalf of Robot Aviation AS, Norway. Although EUROCAE draft material is used, the presentation is not on behalf of EUROCAE

