EUROCAE WG-73: Unmanned Aircraft Systems

Current status of work in the field of
UAS related standards in Europe

Update – 2012-04-18

By

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Presentation Topics

- ❑ **EUROCAE**
- ❑ **WG-73 Focus**
- ❑ **Org. Chart, modifications**
- ❑ **Subgroups / matrix org – brief description**
- ❑ **Current publications**
- ❑ **Roadmap**
- ❑ **Ongoing and future work**
- ❑ **Partnerships and collaborations**
- ❑ **Food for thought**

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The **EUROPEAN ORGANISATION** for **CIVIL AVIATION EQUIPMENT**

❑ EUROCAE is a non profit making organisation which was formed at Lucerne (Switzerland) in 1963 to provide a European forum for resolving technical problems with electronic equipment for air transport.

❑ EUROCAE deals exclusively with **aviation standardisation** (Airborne and Ground Systems and Equipments) and related documents as required for use in the regulation of aviation equipment and systems.

❑ EUROCAE is an association composed of members who are all specialized in one or several technical fields of Aeronautics and many of them are considered to be among world's leaders in their domain.

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The EUROPEAN ORGANISATION for CIVIL AVIATION EQUIPMENT

❑ These members include Equipment and Airframe Manufacturers, Regulators, European and International Civil Aviation Authorities, Air Navigation Service Provider (ANSP), Airlines, Airports and other users.

❑ To develop EUROCAE Documents (ED), EUROCAE organises Working Groups (WG) where members provide experts working on voluntary basis. In general the WG members come from the association membership but others may be accepted under specific conditions regarding the organisation they are belonging to and their particular expertise.

❑ EUROCAE is governed by a Constitution and functions according to procedures resulting from almost 50 years of experience in the development of aviation standards.

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WG-73 Focus

❑ EUROCAE WG-73 was created to analyze and develop standards which will facilitate the insertion of UAS in all classes of airspace

❑ The WG strategy is to enable *incremental access to airspace*, based on defined safety considerations

❑ To keep the work stream on a realistic level, the near term approach adopted was to focus on specifically selected fundamental capabilities which would allow UAS operations with certain restrictions

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WG-73 Focus

Current work has been focused on two main scenarios:

Scenario 1: Entry into, flight in and exit from airspace classes A, B and C under Instrument Flight Rules (IFR)

Scenario 2: UAS operations of all kinds and in all locations within the limits of visual range conditions (VLOS)

From the analysis of these scenarios, a Safety and Performance Requirements (SPR) document will be delivered which will serve to derive Communication, Command and Control (C3) and S&A requirements

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WG-73 Focus

- ❑ Establishment and maintenance of an Architectural and Functional Baseline (OSEIC)
- ❑ Definition of Scenarios and Segments
- ❑ Production of OSEDs (Operational Services and Environmental Description)
- ❑ Safety and Performance Requirements (SPR) analyses
- ❑ Interoperability analyses
- ❑ Compilation of C3-related requirements
- ❑ Compilation of Detect & Avoid-related requirements
- ❑ Compilation of other technical and operational requirements identified in the analyses

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WG-73 Split-up

- WG-73 will continue focusing on Scenario 1

- WG-93, a new working group within the EUROCAE structure, is being established to focus on light UAS (ref Scenario 2)

- The Terms of Reference for WG-73 have been amended accordingly during the Plenary meeting in Brussels, Belgium 2012-03-01

    Scenario 1: Entry into, flight in and exit from airspace classes A, B and C under Instrument Flight Rules (IFR)

    Scenario 2: UAS operations of all kinds and in all locations within the limits of visual range conditions (VLOS)

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WG-93 (new!)

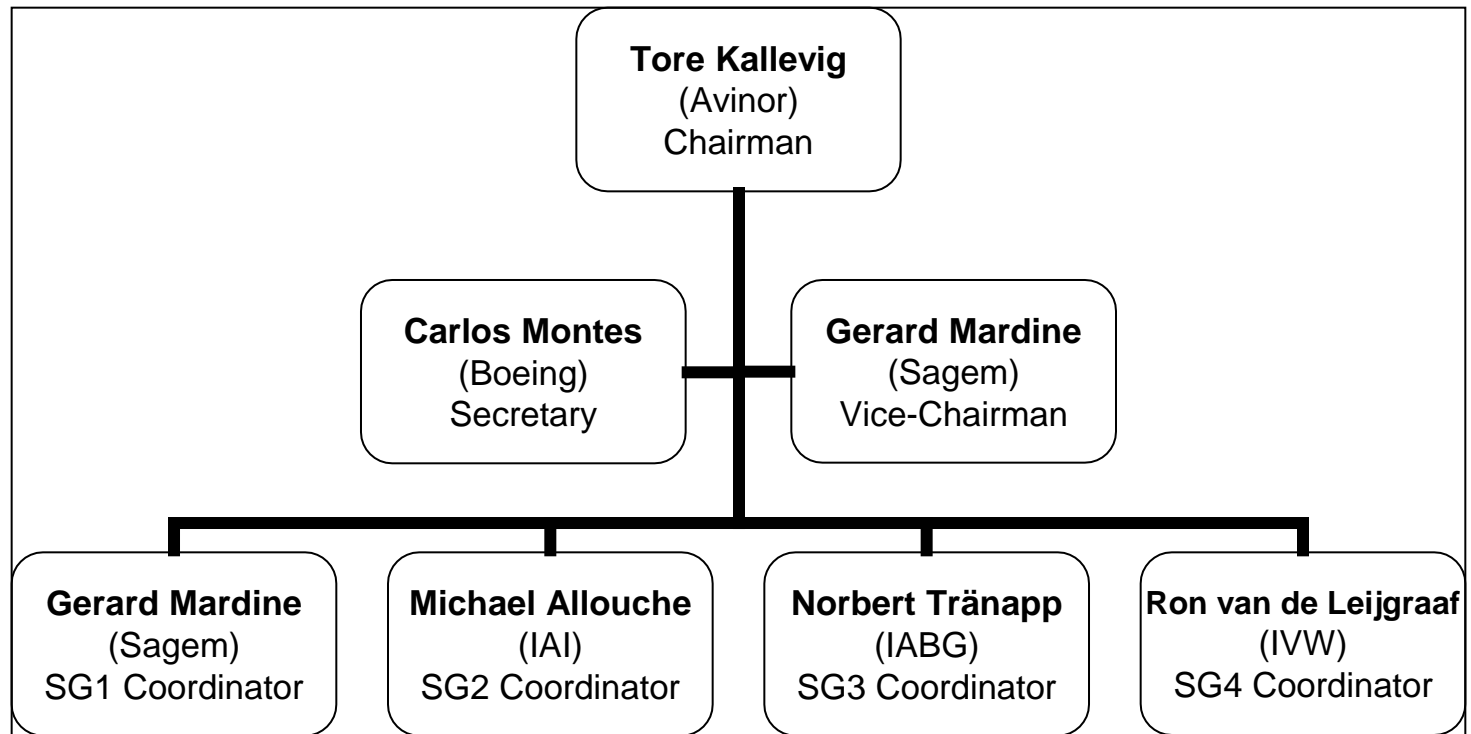- ❑ **adapting the standards to the small UAS particularities**

- ❑ **WG-73 and WG-93 cooperation, coordination**

- ❑ **Detailed presentation after lunch:**

  Defining standards for Light RPAS

  Peter van Blyenburgh, UVS International

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Previous Organizational Chart

Tore Kallevig
(Avinor)
Chairman

Carlos Montes
(Boeing)
Secretary

Gerard Mardine
(Sagem)
Vice-Chairman

Gerard Mardine
(Sagem)
SG1 Coordinator

Michael Allouche
(IAI)
SG2 Coordinator

Norbert Tränapp
(IABG)
SG3 Coordinator

Ron van de Leijgraaf
(IVW)
SG4 Coordinator

Standing Advisor: Peter van Blyenburgh, UVS International

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Org. Chart

Current Matrix – 3 vertical activities + support

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Org. Chart
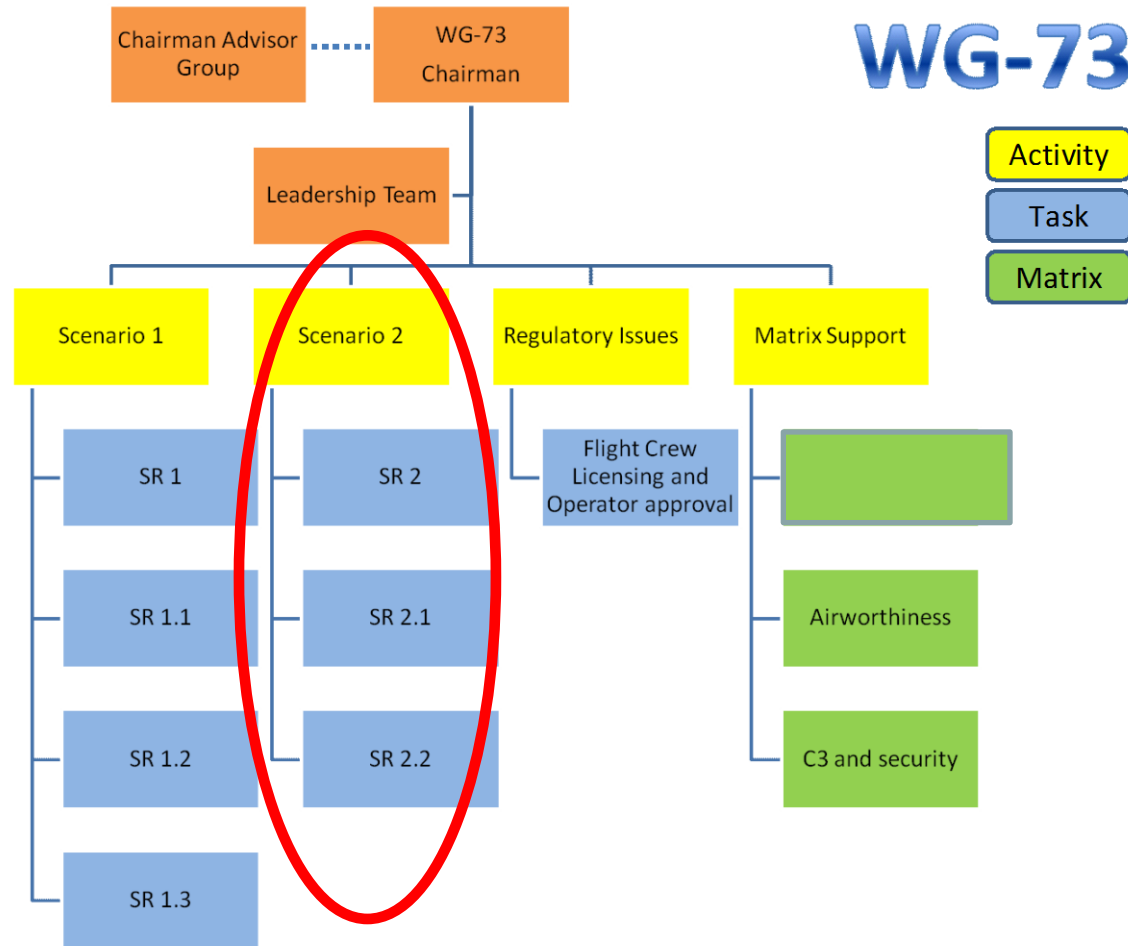
New structure for WG-73, a few changes / challenges:

- ❏ call for participation amongst all EUROCAE members
- ❏ call for nomination for new Secretary
- ❏ Appointment of new Standing Advisor
- ❏ New lead for C3SS Focus Team

Leadership Team

As addressed at the Plenary meeting in Brussels;

- Chairman, Vice-Chairman
- Secretary, Working Plan Coordinator
- Special Advisor, others

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UAS Operations

❑ **The SG1 has been focused on the development of the different concepts of operation intended to facilitate the insertion of UAS in the general airspace**

❑ **Work divided in three main areas**

- ▪ **Concept of operation and system architecture**
  - ▪ System architecture
  - ▪ Scenario definition
  - ▪ Safety assessment
  - ▪ Minimum system performance
- ▪ **Sense and avoid architecture**
- ▪ **Adverse weather avoidance**

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UAS Airworthiness Focus Team

Main objective:

"To develop specific recommendations for detailed UAS Safety Objectives and Assessment Criteria (that could be part of UAS Airworthiness Certification Basis) shall be established in the form of UAS AMC 1309 (Acceptable Means of Compliance) proposal, including at least safety objectives, failure severity definition and related hardware probability & software levels requirements as well as typical UAS failure classification examples"

Three steps planned:

- ❑ Step 1 : Define Top Level 1309 Issues
- ❑ Step 2 : Establish UAS Airworthiness Safety Review Paper
- ❑ Step 3 : Establish UAS AMC 1309 Recommendations

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C3, Spectrum and Security

The main objective of the Command, control, Communications, Spectrum and Security focus team is to develop requirements and standards affecting all UAS equipment from these perspectives.
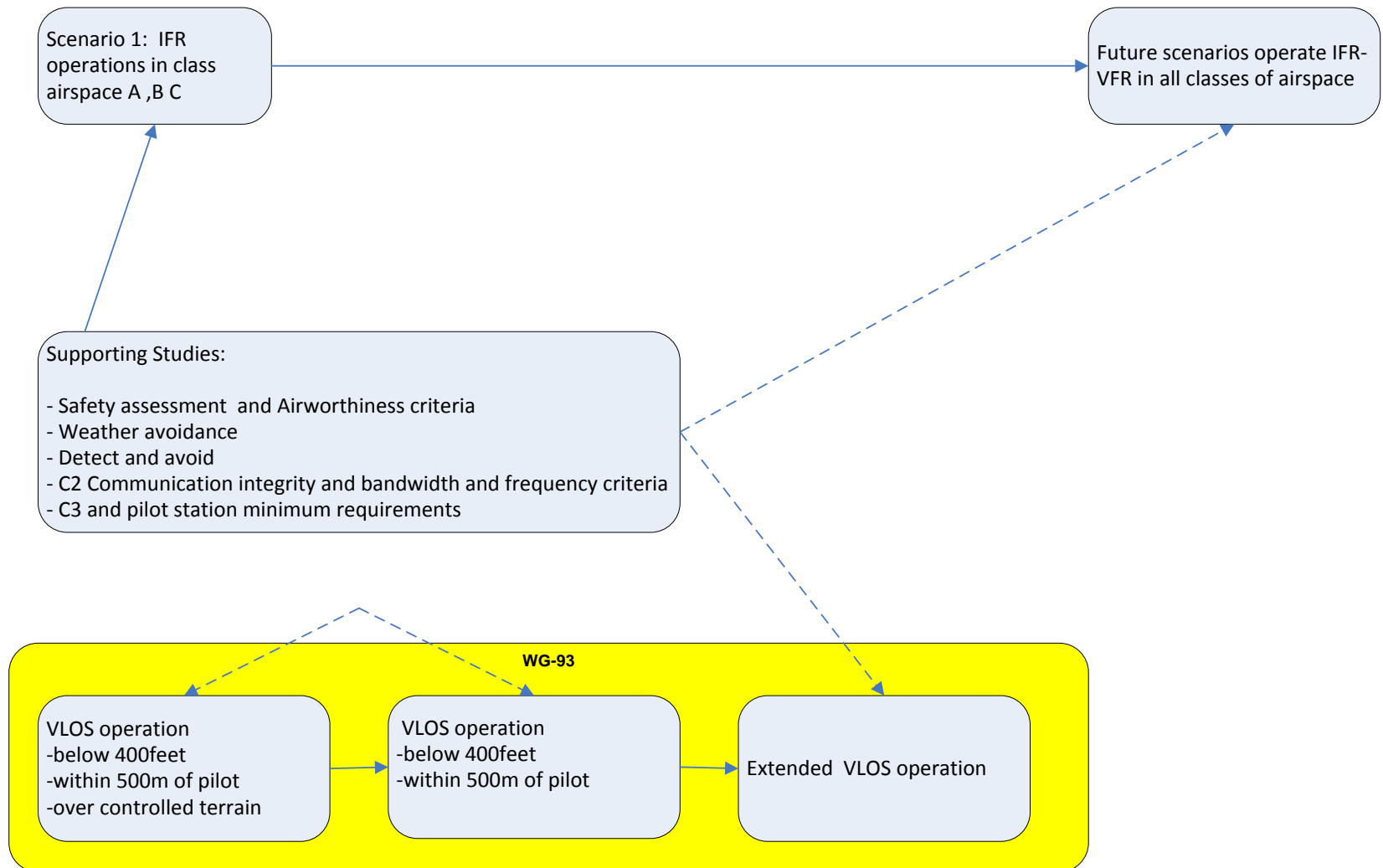
Current status as follows:

3 – Command, Control, Communications, Spectrum & Security (C33SS)	Current Status
3.1 Command & Control Data Processing	Concept paper under preparation
3.2 UAS Radio Spectrum Requirements	Finished and waiting for formal consultation process
3.3 UAS Security Management & Physical Security	Finished
3.4 Communications & Spectrum ATM issues	Finished
3.5 UAS Communications & Electronic	Part 1 finished and Part 2 waiting for formal consultation process
3.6 Overall Communications Architectures	Under preparation

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Current Publications

- ❏ **ER-004 Vol 1: General Considerations for Civilian Operation of Unmanned Aircraft**
- ❏ **ER-004 Vol 2: UAS Operations**
- ❏ **ER-004 Vol 3: UAS Airworthiness Certification**
- ❏ **ER-004 Vol 4: UAS for Visual Line of Sight Operations**
- ❏ **ER-004 Suppl Abbreviations and Terminology for Unmanned Aircraft Systems**

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Roadmap

Scenario 1: IFR operations in class airspace A ,B C

Future scenarios operate IFR-VFR in all classes of airspace

Supporting Studies:

- Safety assessment and Airworthiness criteria
- Weather avoidance
- Detect and avoid
- C2 Communication integrity and bandwidth and frequency criteria
- C3 and pilot station minimum requirements

WG-93

VLOS operation
-below 400feet
-within 500m of pilot
-over controlled terrain

VLOS operation
-below 400feet
-within 500m of pilot

Extended VLOS operation

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Future work and schedule (I)

Non-Scenario specific Deliverables

Document type	Document title	Due date (of final working group draft)
Guidance Information	Material for Command, Control and Communications Concepts	End 2012
Guidance Information	Material for Communication issues- future work	End 2013
Guidance Information	Material forType Classification of UAS	Mid 2013
Guidance Information	Material for Flight Crew Licensing	Mid 2013
Guidance Information	Material for Operator Approval	Mid 2013
Guidance Information	Material for Guidance for UAS AMC 1309 with Typical UAS Failure classification illustration	Mid 2013

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Future work and schedule (II)

Scenario 1 Specific Deliverables

Document type	Document title	Due date (of final working group draft)
OSED, SPR, INTEROP	Safety, Performance and Interoperability Requirements for UAS Scenario 1 – first Draft	Mid 2013
	Safety, Performance and Interoperability Requirements for UAS Scenario 1 – Final delivery	End 2013
MASPS	Traffic encounter MASPS – first iteration	End 2012
	Traffic encounter MASPS – Final delivery	End 2013
MASPS	Weather Avoidance MASPS – first Draft	Mid 2013
	Weather Avoidance MASPS – Final delivery	End 2013
MASPS	Command, Control and Communications MASPS – first Draft	Mid 2013
	Command, Control and Communications MASPS – Final delivery	End 2013

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Partnerships and collaborations

- ***RTCA, Inc.*** *is a private, not-for-profit corporation that develops consensus-based recommendations regarding communications, navigation, surveillance, and air traffic management (CNS/ATM) system issues. RTCA functions as a Federal Advisory Committee*

- *the work performed in the WG-73 is completely coordinated with the RTCA SC-203 which is focused on the development of MASPS and MOSPS for UAS. At the end of 2010 representatives of both groups signed a letter of cooperation reflecting areas of common interest.*

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Partnerships and collaborations

- ***JARUS**, the Joint Authorities for Rulemaking on Unmanned Systems represents the National CAA of several European countries. This group has the objective of developing a single set of draft airworthiness, operational and airspace requirements, accepted by participating countries. Coordination with WG-73 is then required to ensure that there is proper alignment between both activities.*

- ***EASA**, there is a continuous coordination with the European Aviation Safety Agency as the main European regulatory body, in order to ensure that the work performed by the group is in line with the current and future European regulatory framework.*

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Partnerships and collaborations

❑ **ICAO**: The Unmanned Aircraft Systems Study Group (UASSG) was established as a result of the Air Navigation Commission's consideration of a Secretariat proposal suggesting a need had been identified for ICAO to serve as a global focal point for the development of common terminology and definitions and non-technical aspects associated with operation of unmanned aircraft systems.

❑ EUROCAE WG-73 Chairman is officially a member of UASSG

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Global Perspective

Single European Sky

NextGen

Global challenges

Global approach

Splendid isolation?

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ICAO is key

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