



EUROCAE BROADCAST

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54TH GENERAL ASSEMBLY
LONDON



EUROCAE AT WORLD ATM
CONGRESS 2017
MADRID



UK AIRCRAFT OWNERS
AND PILOT ASSOCIATION:
OVERVIEW



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Dear members and friends of EUROCAE,

This year has started with a series of notable changes in our organisation. We have completed the move to the new and modern location in Saint-Denis. We have revamped the IT infrastructure. We have implemented the new membership fee structure. And we are one step closer to the goal of bringing to all our members tangible savings in terms of time and cost associated with participation of experts to working groups.

Our new premises will now enable a short connection time to the airports Charles De Gaulle and Orly as well as the main train stations in Paris that will allow an optimum meeting timing for experts' participation to meetings. The new premises now include three meeting rooms, fully equipped state of the art audio and video equipment, a communication area for breakout sessions and all our experts need for an efficient and constructive meeting. You will see that the meeting standard has changed significantly, just come and see us!

The Business Plan 2016 and 2017 clearly indicated that EUROCAE lacks the adequate number of staff and resources to ensure the proper support and functioning of the increased demand for standards. EUROCAE is now able to better respond to the strategic objectives of the organisation and of our members. The current membership fee system, approved by our members at the last General Assembly, allowed us to bring onboard an additional Technical Programme Manager to better respond to our members' demand, given the 36 active working groups. This is a record-high number of parallel activities we've engaged in, at the request of our members.

Another notable development is the organisation of this year's edition of the Symposium in one of the most vibrant and chiefly important aviation centres in the world: London. With 12% of our members coming from the United Kingdom, we see a clear interest and active involvement here, translating in 26 member organisations supporting the mission of EUROCAE.

Our special event features distinguished representatives from EASA, European Commission, ICAO, SJU, FAA, RTCA, EUROCONTROL, UK CAA and prominent industry leaders from around the world tackling the most topical subjects of the aviation industry: Performance Based Regulations, Unmanned Aviation Systems (UAS), Performance Based Navigation (PBN), Datalink and Service Wide Information Management (SWIM).

EUROCAE keeps abreast with the developments in our industry – and keeps you informed in a timely and professional manner via the Broadcast and the periodic NEWSblogs.

I am pleased to report to you that there are several new and exciting projects at the horizon in 2017.

EUROCAE will launch a training programme in Cybersecurity, with the first such activity scheduled for Q3, 2017. We are also organising on 31 May together with EASA in Brussels a Cybersecurity workshop to shape and tailor the regulatory and EUROCAE work programme on standardisation, for this high priority item.

On the UAS side, WG-105 kicked off very well and the work is already ongoing in all six focus areas. We are also about to launch the European Unmanned Aircraft Systems Standards Coordination Group – EUSGC, in coordination with the EC and EASA, following the principle of the EASCG (European ATM standardisation coordination group).

I would like to take this opportunity to congratulate the small but very dedicated EUROCAE Secretariat team that enabled the smooth transition over the move, with virtually no impact on daily business, while maintaining a top responsiveness towards our members.

Christian Schleifer-Heingärtner
Secretary General

WG-72

Activities on Aeronautical Systems Security



Normally, the 11th anniversary is not necessary the most noteworthy of all anniversaries. But Working Group 72, developing standards related to Aeronautical Systems Security, is in an important phase of its life.

Mid of 2016, the group has started working on a new subject, Security Certification of ATM Systems (ED-205). It is the beginning of reaching out from the aircraft- and safety-centric perspective of the work to the ground- and more business continuity-centric logic. Looked at from a large European perspective, this also means airspace capacity-centric.

At the same time, the existing airworthiness security process-centric work continues, while the

understanding of critical factors and contexts grow with the increased application of previous versions of existing standards (ED-202A, ED-203). While working on the next version of the latter, which had been published separately from a similar variant of RTCA (DO-356), the revision work significantly focuses on harmonising the two documents in Europe and the US and to keep them harmonised in the future. Also, the need to align ED-204 to the modifications and enhancements of ED-203 has been identified recently.

Over the last years, ED-201 has been published and applied. The result was the realisation that some sections will have to be updated to reflect the experience made during its application, and the feedback from the community is very valuable in this regard.

The real importance of the working group, however, has followed the increasing awareness and concern of the subject of information security in aviation. All industry and governmental stakeholders now understand the high potential of the large-scale risks caused by aeronautical systems security. And it has been understood that all stakeholders will have to coordinate technical and operational efforts and collaborate in establishing seamless protections in order to protect the civil aviation ecosystem. One key factor to make a sustainable level playing-field happen and to keep it effective will be a comprehensive set of rules which all stakeholders will adhere to. Technical Standards will provide foundational elements to such set of rules.

In Europe, EASA is the organisation tasked with safety of aviation, regardless of the risks associated with it. Since many years the agency has created temporary rules, called Special Conditions, to assure that initial airworthiness of aircraft considers information security risks.

The EASA High Level Meeting Cybersecurity in Civil Aviation concluded that to ensure both a level playing field and a balanced sharing of risk management, cybersecurity in aviation will require risk and performance based sectorial regulations that benefit from industry standards to the greatest extent possible.

EASA and EUROCAE are jointly organizing a workshop to discuss current activities and future regulatory and standardization needs with key stakeholders from industry, airspace users, Member States, European institutions, academia.

The Cybersecurity Workshop will be held on 31 May 2017, at the EASA premises, 100 avenue de Cortenbergh, Brussels, Belgium.

Further information on the workshop is available at www.eurocae.net/events

If you wish to participate, please send an email to cybersec@easa.europa.eu before 5 May 2017, providing your name, organisation, and contact details.

As places are limited, successful registration will be confirmed by email after 5 May.

EUROCAE Publications developed by WG-72

- ▶ **ED-201** AISS Framework Guidance Document
- ▶ **ED-202A** Airworthiness Security Process Specification
- ▶ **ED-203** Airworthiness Security Methods and Considerations
- ▶ **ED-204** Information Security Guidance for Instructions for Continued Airworthiness and Continuing Airworthiness
- ▶ **ER-013** Aeronautical Information System Security Glossary

By Jean-Paul Moreaux, EASA, WG-72 chairperson

WG-80

Hydrogen Fuel Cell Systems (joint with SAE AE7)

An insight on how fuel cells function, the benefits and the expected developments for aviation

Fuel cells are electrochemical devices that convert chemical energy of a fuel and oxidant directly into electrical energy. They can be much more efficient and environmentally benign than conventional electric power generation processes. Their inherent characteristics make them uniquely suitable to address the environmental, climate change, and water concerns associated with fossil fuel based electric power generation. In particular, in aeronautics, fuel cell systems can play an important role in the development of the More Electrical Aircraft (MEA) concept, as highly efficient power generation systems.

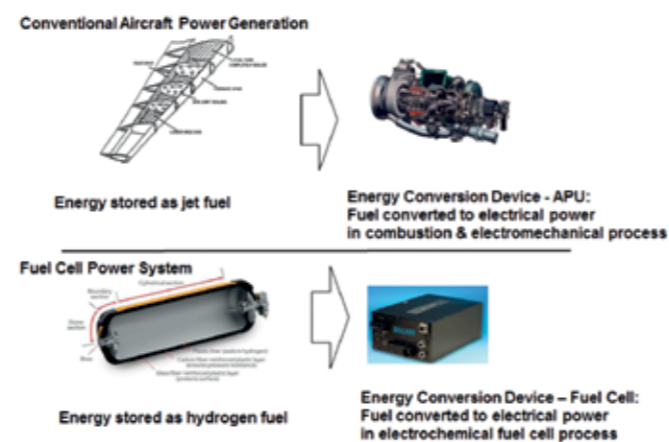
Fuel sources for the fuel cell are, to a large extent, application dependent and can include liquid hydrogen (in cryogenic form), gaseous hydrogen (up to 700 Bar), light hydrocarbons (when used with a Solid Oxide Fuel Cell (SOFC)), solid fuels (hydrides where the hydrogen is either product of a reaction or decomposition), fuel reforming or electrolysis (decomposition of water into hydrogen and oxygen).

Applications of fuel cells on aircraft have been identified which require a low level of integration (non-intrusive applications), such as power sources for medical equipment/systems or for galleys (cabin and hotel loads, 5-20 kW), to those which fulfill essential functions on-board, such as emergency power (15-50 kW), replacement of the APU (> 50 kW) or even full aircraft propulsion in general aviation (> 40 kW). Besides commercial air transport and general aviation, electrical unmanned aerial vehicles (UAV) have also shown interest for fuel cells as a key means to offer an improved endurance and range mission capability.

The fuel cell technologies for these applications are at various stages of technical maturity, but in general most systems are still in development. However numerous projects throughout the world have already demonstrated and confirmed the potential of fuel cell technology to match aircraft needs and have helped identify the main remaining challenges and bottlenecks.

The areas where further progress is needed to make fuel cell based energy generation systems viable for the aircraft industry include: the fuel cell system weight and volume, the required extended lifetime and reliability to comply with aircraft operation and maintenance schedules, the ability of the technology to demonstrate compliance with the specific aerospace airworthiness certification requirements (essentially related to hydrogen safety considerations), the cost effectiveness of the corresponding system designs and their full integration into the aircraft.

Conversion of Chemical Energy into Electrical Energy on Aircraft:



By Olivier Savin, Dassault Aviation, WG-80 Chairperson

WG-81

Interoperability of ATM Validation Platforms

The imminent release of ED-147A marks an important milestone for the group.

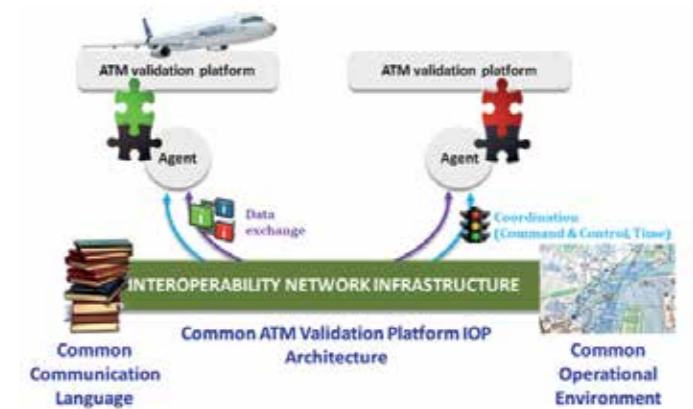
Nowadays, ATM concepts of operation cannot be validated in isolation anymore. Information exchange between all stakeholders involved in the ATM system of systems is mandatory to improve the processes of those stakeholders and the whole ATM system. While in the past ATM validation activities were executed more in isolation within the different ATM domains it was recognised during SESAR Definition Phase that this situation needs to be overcome.

European project AVENUE (ATM Validation Environment for Use towards EATMS - 2004) already provided means for the interoperability of different En-route simulators. The French project GAIA aimed at making simulators from different domains like aircraft, tower and En-route interoperable.

Results of these projects were taken into account during the creation of ED-147 "ATM Validation Platforms Interoperability Specification", which was published after four years of effort in 2013.

MAIN ED-147 STANDARDISATION GOALS

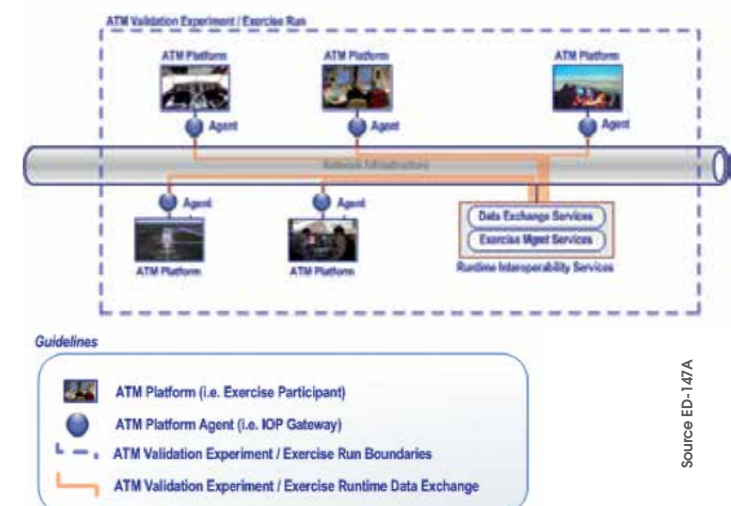
- ▶ Define a Common Communication Language that results in an ATM domain specific Reference Information Model (RIM) comprising unambiguous types and units of data supporting the information exchange between interoperable ATM Validation Platforms
- ▶ Define a Common ATM Validation Platform IOP Architecture comprising the key architectural and data exchange concepts, state management, time synchronisation as well as Interoperability Services
- ▶ Define a Common Operational Environment that helps exercise participants in an early stage to define common input and output data exchange formats based on standards



During SESAR Development Phase (2009-2016) up to twenty Validation Exercises took place, taking advantage of reusable ED-147 implementations. In most cases, those exercises connected ATM Validation Platforms from different ATM domains like Aircraft/Ground, Aircraft/Tower and Ground/Ground.

The ATM Validation Platform Interoperability Logical Architecture in the following figure shows how ATM Validation Platforms from different ATM Domains are interconnected by means of Agents.

ATM Validation Platforms Interoperability Logical Architecture



Source ED-147A

ATM Validation Platforms consist of ATM Simulators and depending on the E-OCVM maturity of the exercise ATM System prototypes. Especially in SESAR Validation Exercises with E-OCVM level V3 this combination was the standard setup.

BENEFITS REPORTED BY ED-147 USERS

▶ **Airbus: Reusability of ED-147 Agent Gateways**

Simulators being a part of ATM Validation Platforms are connected to an Exercise Run by means of so-called Agent Gateways. Once verified the simulator can reuse this connection every time a new connection with another ATM Validation Platform needs to be established. This is helpful to apply Airbus V&V strategy based on usage of more and more representative simulators (models rather than real equipment).

▶ **Airbus: Sharing the same view on the interface**

During the preparation of a Validation Exercise the validation partners agree on the so-called Common Information Model (CIM), which is either a copy of the Reference Information Model (RIM) or an adaptation of the RIM that is tailored to the Validation Exercise needs. Sharing and agreeing on the Common Information Model is a key aspect for reaching Interoperability between ATM Validation Platforms, because it leads to a common understanding how the information exchanged needs to be interpreted.

▶ **DFS: Usage of ED-147 reduces integration efforts**

During the development of ED-147 DFS and EUROCONTROL Experimental Centre (EEC) were launching an experiment to build an ED-147 implementation based on HLA Evolved (IEEE1516:2010) in order to connect their En-Route simulators NESWIM and ESCAPE. The results were promising; the first integration took less than four hours and was done directly via Wide Area Network.

CONCRETE EXAMPLES

▶ **Airbus: SESAR D-TAXI exercises with ENAV**

SESAR D-TAXI exercises connecting Airbus Flight Simulator and ENAV Tower Simulator

▶ **Airbus: Airbus with ENAC coupled demonstration**

During WAC 2017 Airbus and ENAC demonstrated how Airbus Aircraft Simulator was able to exchange information with ENAC simulators from various ATM Domains (Aircraft, ATG, Tower, En-Route and Approach)

▶ **DFS: SESAR FO IOP Validation with DFS, DSNA and EUROCONTROL MUAC**

In SESAR FO IOP Validation Exercises took place connecting En-Route simulators from DFS, DSNA and EUROCONTROL Maastricht Upper Area Control in order to support the FO IOP validation by locally stimulating operational prototypes of DFS iCAS, DSNA Coflight and MUAC New FDP.

Experience gained from SESAR exercises and other sources was used to improve ED-147 and enable the group to work on a new release. ED-147A is going to be released in spring 2017.

ED-147A

ED-147A Reference Information Model was adapted according to feedback received. New objects like e.g. AirborneFlightPlan and GroundVehicle were introduced in order to better support future validation exercises.

ED-147A identifies and develops further the time synchronisation capabilities of participating ATM Validation Platforms. This includes the synchronisation of the prepared scenario timelines, the choice of either UTC time or logical time as the reference time, and the hot rejoin. Fast-Time/Fast-Time and Fast-Time/Real-Time Interoperability are also addressed.

ED-147A is currently limited to the logical level, where the data model, the message exchange patterns and services are described using abstract notations and (formalised) natural language. In other words the actual physical interoperability layer is not addressed, yet (API or wire). This does not keep various experiments, as mentioned above in the context of SESAR, to use actual implementations of ED-147A concepts and services on different technologies, achieving interoperability in a rather straightforward way.

NEXT STEPS

▶ **ED-148**

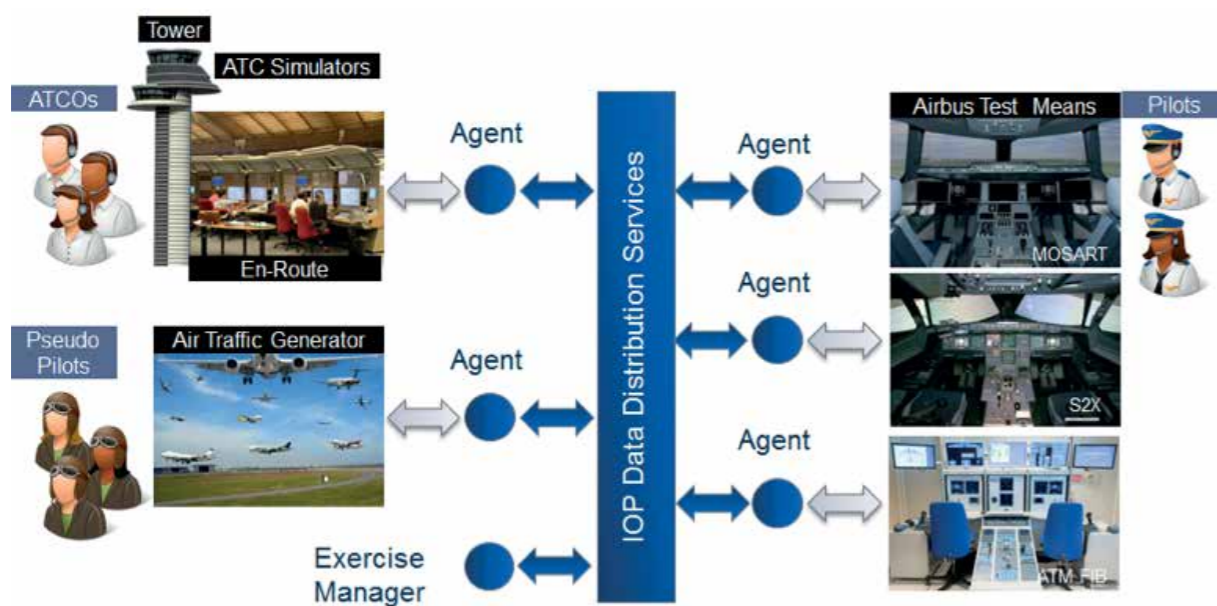
The group is currently working on the finalisation of the first release of ED-148 "Guidance to achieve ATM validation platforms interoperability" providing support to the users of ED-147A and trying to help participants in distributed Validation Exercises to reach Interoperability of their Validation Platforms.

▶ **ED-147B**

As a possible next step, the group will formalise the mapping of interoperability concepts and services on an agreed set of technologies. These technology mappings will be expressed in terms of model-driven engineering, rules and guidelines.

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By WG-81 team



Source Airbus

WG-92

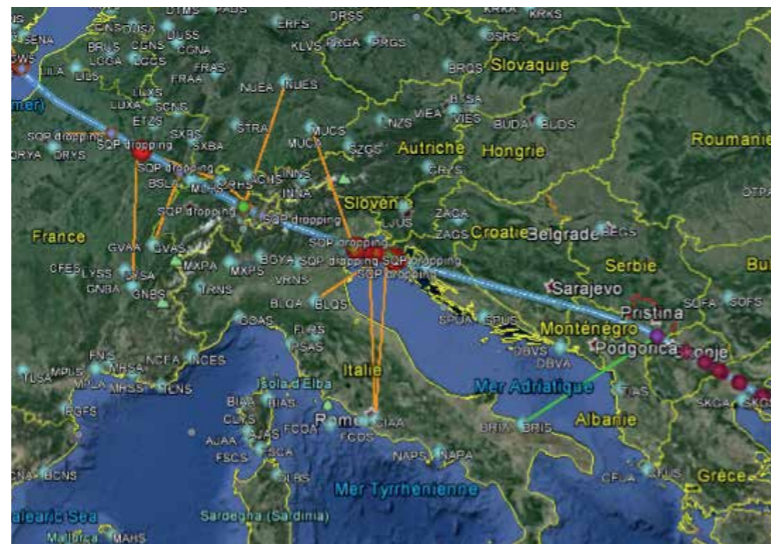
VDL Mode 2

The task of WG-92 is essentially to maintain the current ED-92B version up to date and synchronised with VDL standards mentioned above. ED-92 is used in the baseline for the certification of the avionics systems and has to be consistent with the expectations of the DLS mandate introduced by Regulation (EC) No 29/2009 of 16 January 2009 laying down requirements on data link services for the single European sky (the DLS IR).

The DLS-IR situation in Europe has conducted the European Commission to mandate the SJU to study the VDL Mode 2 performance issues leading to provider aborts. The ELSA consortium, which has been awarded by the SJU to lead this study, has to work closely with EUROCAE and RTCA:

- ▶ To take into account the standards and material produced by the committees,
- ▶ To provide results that will be used by these committees to further develop the standards updates.

The ELSA report has been released and provides some recommendations that have been reviewed by the WG-92 in collaboration with RTCA SC-214 VDL-SG and AEEC DLK Technical Subcommittee. The ELSA report has also done the so-called "Best-in-Class" tests. These tests aimed at ensuring that, in a representative environment of the actual VDL deployment in



Europe and the future deployed multi-frequency environment, the avionics systems reach the expected level of performance (notably no Provider aborts). These "Best-in-Class" tests have been done on various equipments from several suppliers and have raised some performance issues.

In addition, while working on ED-92B which currently only contains test cases for the avionics systems, the WG-92 identified the need to add test cases related to ground systems requirements in order to ensure the interoperability of the VDL Mode 2 systems.

Finally, a VDL Connection-less mode is under study by the VDL working groups as it should improve the system performances and reliability. The on-going discussions may lead to VDL standards update (ICAO 9776, ARINC 631, MASPS & MOPS) and, in that frame, ED-92B should be impacted.

A main objective of the discussions regarding the Connection-less mode is to ensure the backward compatibility. The VDL systems will then remain compliant with the DLS-IR mandate.

WG-92 works closely with the VDL Subgroup of RTCA SC-214 "Standards for Air Traffic Data Communication Services" and the AEEC Datalink Technical Subcommittee. The three groups ensure that all the VDL standards are consistent with each other.

The group is working on the perimeter of the ED-92C which will be used as a baseline for the DLS-IR avionics mandate in 2020. A strong relationship with the European organisations (such as the EASA and the SESAR JU) will be put in place. Also a companion document to ED-92 will be defined by the group for end of 2018 that will define the expected behavior of the VDL ground systems to ensure the interoperability of the system and reduce drastically the Provider Aborts.

The WG-92, jointly with the AEEC and RTCA VDL groups, will work intensively in 2017 and 2018 to prepare the future updates and ensure the standards and related equipments will be available on time for the DLS-IR mandate.

ED-92 publication history:

- ▶ ED-92 March 2000
- ▶ ED-92A June 2003 alignment with AEEC specs
- ▶ ED-92B October 2012 MF function
- ▶ ED-92B ch1 March 2014 new alignment with AEEC

WG-99

Determining Aircraft Portable Electronic Device (PED) Tolerance

Safely dealing with electronic devices on board aircraft has been a long, evolving process, ever since concerns were raised about the usage of electric razors onboard planes in the 1950's. Fast forward through the testing of operating two hundred laptops onboard an empty aircraft fifteen years ago, to today when airlines cannot escape the ubiquitous use of cell phones, and the variety of PEDs, is limited only by the imagination of PED creators.

Consolidating all guidance material for usage of PEDs on aircraft has been a massive undertaking for joint EUROCAE WG-99 and RTCA SC-234, under the leadership of Robert Kebel (Airbus) and Stephan Schulte (Lufthansa), Co-Chairs of EUROCAE WG-99 and RTCA SC-234 Chair Billy Martin (National Institute for Aviation Research at Wichita State University).

The journey toward creating a current set of PED Minimum Operational Performance Standards (MOPS) began in October 2013, when the FAA released information for aircraft operators on how to expand passenger use of PEDs safely. After a year and a half evaluating this information in action, the EUROCAE initially initiated WG-99 and shortly thereafter FAA initiated RTCA's SC-234, Portable Electronic Devices, bringing together electromagnetic effects experts from the aviation industry to include aircraft manufacturers, operators, aircraft system designers, and regulators.

The first objective of the joint group was to issue an industry consensus guide for PED safety risk approach throughout the aircraft lifecycle, followed by the evaluation of advancements in PED and aircraft systems, to see if the assumptions made in

past EUROCAE and RTCA PED work still held true in today's operating environment. It took into account comprehensive testing by aircraft manufacturers, and evaluation of all previous documents, with its overarching goal to validate that PEDs would not interfere with aircraft systems.

Billy Martin said the concerns going in were two-fold: First, the Committee dealt with the "front door," meaning the information that comes through the antennae to the receiver, and second, the "back door," which is concerned with radiating a signal and causing interference. Next, Billy said, the Committee dealt with two guiding principles. First, the reality that the flying public demanded the use of PEDs onboard, and second, that the Committee needed to develop MOPS that encompassed the huge variety of these devices.

Stephan Schulte said the biggest challenge they faced was creating standards that were general enough to adapt to technology, but specific enough to provide precise and unambiguous guidelines and standards which lead to reproducible, comparable results, regardless of who is creating those results.

"The direction from both groups, RTCA and EUROCAE, was outstanding, as they synchronised between working groups on either side of the ocean," said Stephan Schulte. "It's the first time that we now have one single document outlining standards that avoids confusion and supports the initial idea of reproducible and comparable results. The maturity of technological development, plus the group's expertise gained since the first issue of those documents, helped to create a great, generic guideline document. The diversity of group members (airlines, MROs, authorities, airframe

and system OEMs) formed a great community with contributions from each side. Both RTCA and EUROCAE provided a forum that allowed for the revision of the document and did a great job in providing a process, all the way to a formal approval."

This joint committee has worked extremely well together. In just over a year since its start, this Committee has completed the FRAC process for one new guidance document, and one revision to a minimum operational performance specification document.

"SC-234/WG-99 is a great example of a successful collaboration between RTCA and EUROCAE," said RTCA President Margaret Jenny. "We appreciate the added challenge of international harmonisation and we're impressed with the streamlined result."

«The excellent collaboration with RTCA towards reaching global interoperability is perfectly reflected by the SC-234/WG-99 activity. The quality results reached in such a timely manner show that together we can deliver the results the aviation community is expecting from us.»

Christian Schleifer-Heingärtner
EUROCAE Secretary General

The documents were successfully released mid December 2016.



Snapshot from the plenary meeting in Frankfurt (GER)



Snapshot from the Meeting in Cologne (GER)



Snapshot from a meeting in Washington DC (USA)

WG-104

Standardisation of SWIM services

WG-104, tasked to provide the “Arrival Management Information Service” as a standardised SWIM service description, has handed-over its first deliverable in February 2017 to the TAC. This first deliverable, which consists of recommendations for further services to be standardised by EUROCAE, will be assessed by the EUROCAE TAC and will afterwards result in further EUROCAE calls for service standardisation activities.

In order to provide the most appropriate proposal for future service standardisation, WG-104 has elaborated a set of criteria for the selection of valuable services that are potential candidates for standardisation. This deliverable is also accompanied with a proposal on how to structure the future service standardisation work within the EUROCAE working groups.

Continuing on its main objective, WG-104 is working on the definition of requirements for the standardisation of the arrival sequence information service. As shown in the following illustration, the arrival sequence information service aims to distribute the delay information, which has been calculated by an AMAN system to the upstream ATSU, to enable them to help avoid holding patterns in the TMA area.

Whereas the elaboration of the Requirements on the logical design is nearly completed, a lot of effort still will have to be spent on the elaboration for the technical design.

The service functionality has been derived from the to SESAR Solution pack - Extended Arrival Management (AMAN) Horizon (OSEDs, SPR/Interops), which included Information Exchange Requirements in support of the extension of the AMAN horizon.

The respective Interface Exchange Requirements describe the AMAN sequence data content, including advisories like a TTL (Time To Lose) or TTG (Time To Gain), to deliver towards an upstream ATSU, contributing to the optimal arrival sequence at the destination airport and to the prevention of flight holdings.

The service description is composed of requirements on the service interface and on its nominal and non-nominal behavior. It also covers technical requirements, addressing a real life technical implementation. In addition, Non-Functional-Requirements (e.g. Quality of Service) are provided, which need to be offered by the provider.

As this is the first time EUROCAE has initiated the standardisation of a SWIM service, WG-104 identified additional work that can be beneficial for all future SWIM Service Descriptions (e.g. error handling, filtering, ...). A report that captures the lessons learned from the work, with recommendation regarding the methodology will be provided as a deliverable from WG-104.

WG-104 will provide three deliverables by end of 2017:

- 1 The standardised Arrival Management Information Service (as a first example for a standardised service)
Note: As usual this standardised service will then be introduced into the EUROCAE Open Consultation process.
- 2 Guidelines for standardisation of SWIM services
- 3 Lessons learned from WG-104's work on service standardisation



This service will provide functions necessary to operate Arrival Management with an extended horizon (XMAN, Cross Border Arrival Management) in an environment where multiple actors are involved e.g. multiple Airports, AMANs, ACCs, UACs and NM.

The joining of further organisations to WG-104 as well as the request for early material from WG-104 show that there is a great interest within the ATM community in having standardised SWIM services available for their own use.

By WG-104 team

Since its initiation, WG-104 has attracted a lot of interest from persons outside the initial working group. In the meantime, several new members have joined the working group (amongst them are Leonardo, Thales, NATS and LfV).

In addition, there is already a request from SESAR solution PJ15-02 to provide them with the standardised E-AMAN service specification (which WG-104 is currently developing). PJ15-02 intends to use this standardised service specification as a basis to build their prototypes for the related validation activities.

WG-105

Standardising UAS Operations

Already since 2006 EUROCAE is working on the standardisation of the safe integration and operation of Unmanned Aircraft Systems (UAS) in the airspace. At that time Working Group WG-73 was created.

In order to facilitate the development of standards and guidance material for small aircraft and to encourage the participation of smaller organisations in the activity, WG-93 was created as a spin-off of WG-73.

Over the last few years, the political and regulatory framework for the operation of unmanned systems has changed. In particular the Riga and the Warsaw Declaration by the European Commission and the EASA A-NPA 10-2015 have established a new approach towards the integration of UAS into the airspace. It was recognised that only a performance based approach would be successful in this dynamic segment of aviation. Rules and regulations as they apply to manned aviation (with the certification based process) are not fit for purpose in a market that is fragmented and covers a huge spectrum, both in terms of aircraft and operation. The processes have to be adapted in a way that they are suitable for the hobbyist who wants to operate his small UAS for pleasure all the way to the large, military aircraft performing global IFR operations. Also the number and variety of UAS taken into operation does not allow the same approach as for manned aviation.

Once this was established, the way proposed forward was based on the risk of an operation. In this risk-based, operation centric approach it is not the size of the aircraft that determines the rules to be applied but the risk of the operation. In the EASA A-NPA 10-2015 three classes of operations were defined: Open, Specific and Certified with an increasing complexity and attributed risk. (This EASA A-NPA has currently been followed by the EASA UAS Prototype Regulation to enforce these categories in future Implementation Rules.)

Once it was accepted that it is the operation that determines the applicable rules and not the size or type of aircraft, the EUROCAE approach of two WGs split by the size of aircraft had to be revisited. Based on a Council decision, the EUROCAE Secretariat organised a workshop with the goal to determine scope and organisation of the future UAS related work programme. More than 70 participants attended the workshop on 04 March 2016 which came up with clear recommendations: the work should be organised in one WG, covering all types of UAS applications and operations, strictly focussing on specific deliverables and with extensive coordination with the other players in the field to avoid gaps and duplication of work.

Together with the leadership of the then still existing WG-73 and WG-93, the Secretariat picked up those recommendations and developed Terms of Reference (ToR) for a newly to be created WG - WG-105 was born with the approval of the ToR on 29 September 2016. It has to be noted that - for the first time - extensive coordination activities were performed with other organisations, such as EASA, the SESAR JU and JARUS (the Joint Authority for Rulemaking on Unmanned Systems) to ensure that the work programmes are complementary and well aligned.

Since the work of WG-105 covers all aspects on UAS operations, a suitable organisation had to be found to ensure that all activities are appropriately resourced, well managed and harmonised across all WG-105 activities. The work was allocated to different Focus Teams (FT) with clearly defined deliverables and a firm schedule. Focus Team Leaders will ensure that those deliverables will be drafted in line with the respective provisions in the WG-105 ToR. To harmonise the work of the individual Focus Teams across the whole Working Group, a Steering Committee (SC) was installed, composed of the two WG Co-Chairs, the WG Secretary and the FT Leaders. Other experts may be invited to the SC meetings as required.



In the following paragraphs the tasks and responsibilities of the individual organisational entities will be described:

► Steering Committee

The main role of the Steering Committee is to harmonize and coordinate the Programme of Work (PoW) of the different Focus Teams, in accordance with the terms of reference. An equally important role is to oversee the coordination at a Focus Team level and the Working Group interaction with EASA, JARUS and associated stakeholders.

► Focus Team UAS Traffic Management (UTM)

The primary focus of the UTM FT is the development of UAS regulatory standards based on requirements and solutions for UAS Traffic Management (UTM) for very low level operations (VLL). The group will concentrate on the fundamental technical requirements, operational functionalities and airspace integration requirements for Identification, and Geo-fencing with a view to preparing a basis for industry standards.

► Focus Team Command, Control, Communication (C3)

Focus Team C3 is split into three sub-groups: C2 MASPS/MOPS, C2 Spectrum and C2 Security. The aim of the FT is to deliver, for each sub-group, a set of ED-78A and associated ED-202 artefacts (OSED, SPR, INTEROP) to support Line of Sight (LOS) and Beyond Line of Sight (BLOS) C2 Standards. When successfully completed, EASA may use those deliverables to derive ETSOs and the related AMC.

► Focus Team Detect and Avoid (DAA)

The Detect and Avoid Focus Team is split into three sub-groups: DAA for airspace classes A to C, DAA for airspace classes D to G and DAA for VLL airspace. The objective of the team is to develop standards, in the form of OSED, MASPS and MOPS, related to conflict management for all RPAS categories of operation and in all airspace classes.

► Focus Team Automation

The Automation Focus Team is split into three sub-groups: Auto Taxi, Automatic Take-off and Landing (ATOL), Automation and Emergency Recovery (A&ER). The objective of the team is to develop the necessary standards covering these three domains to enable safe integration of all classes of RPAS into all classes of airspace. The standards will be delivered in the format of OSED and SPR/INTEROP underpinned by an overarching CONOPS. Extension of the Program of Work to develop MASPS and MOPS will be considered in due time.

► Focus Team Design & Airworthiness Standards and SORA

For the short term, the main objective of this Focus Team is to prepare Work Plans in the following domains:

- a) Identification of standards - existing or to be created - to support the various risk mitigation measures stated in the SORA
- b) Support to the establishment of the future AMC1309 in due consideration of the JARUS WG6 - EUROCAE WG73 "1309" conciliation team report
- c) Identification of potential standards / Acceptable Means of Compliance to support the emerging EASA RPAS Special Conditions / Certification Specifications.

This Work Plan is likely to recommend further activities within WG-105 subject to ToRs amendments to be discussed at the next Plenary Session.

Working Group 105 kicked off its activities on 14 to 17 November 2016 with some 75 organisations that have positively replied to the Call for Participation launched in September 2016. It has since established the envisaged structure and taken up its work. Participation in the activities of WG-105 is still possible. In case you are interested please contact the responsible EUROCAE Technical Programme Manager Alexander Engel (alexander.engel@eurocae.net).

EUROCAE Annual Symposium & 54th General Assembly

DAY 1 | THURSDAY, 27 APRIL

Registration: 09:00 AM

Opening Session: 10:30 AM

Keynote Speakers: 11:00 AM

Session 1: Performance based regulations 12:00 - 13:00 PM

Performance-based regulation has been recognised as a new regulatory approach that focuses on desired, measurable outcomes, rather than prescriptive processes, techniques, or procedures, leading to defined results without specific direction regarding how those results are to be obtained.

However, more high-level, performance-based regulations need to be supported by technical standards that provide means of how to comply with the requirements. This has been widely recognised by the regulators and industry stakeholders and is being actively pursued at many levels.

ICAO has set up the Standards Round Table, looking at processes and procedures to implement this approach to drafting of their provisions and enhanced cooperation with the Standards-Developing Organisations (SDOs), and regional and national organisations such as EASA and the FAA already have a long tradition of collaboration with the standardisation bodies.

This session will look at the concept of performance based regulation and its practical implementation, based on examples and best practices from various organisations and subject matters.

Session 2: General Aviation 14:00 - 15:00 PM

The majority of the world's aircraft are GA and most of the world's airports serve GA exclusively.

Also, GA is an environment for experimentation.

The first all-electric aircraft to fly are GA. Innovative avionics are available, although different certification and approval regimes limit the degree of uptake. This is changing in both Europe and the USA and moving towards performance-based, industry-consensus standards.

GA can fly in the same airspace as Air Transport, so must be able to interoperate safely. GA flies also in uncontrolled airspace with limited interaction with ATC or other aircraft. This leads to a huge variety of technical equipment but with many commonalities. VHF radio communication is universal, while surveillance transponders work on the same frequencies and protocols worldwide and all pilots need to be able to navigate accurately. GPS has facilitated instrument approaches at more and more GA airports, with work on PBN approaches for GA airfields under way, supported by SESAR.

ADS-B and Multilateration to complement radar will increase as European infrastructure is modernised. This has already happened in the USA, where all aircraft are required to be ADS-B equipped by 2020. Moreover, the European surveillance "mandate" is being revised, with possible impact on many GA aircraft. The panel will discuss the key challenges that arise for GA, including how to provide suitable equipment at a proportionate and affordable cost.

Session 3: UAS – regulatory perspective 15:00 - 16:00 PM

Unmanned Aircraft Systems (UAS) has without doubt been the most dynamic sector in aviation over the last couple of years. But it is also extremely diverse with aircraft ranging from a few grams to hundreds of kilograms. Even wider is the spectrum of UAS operations: from the hobbyist who wants to use the aircraft for pleasure - all the way to the military systems that are flown using Instrument Flight Rules (IFR) around the world.



These systems and their operations have to be integrated into civil airspace in a way that is safe for both existing manned aviation (GA and Air Transport) and for the UAS newcomers. This requires an adaptation of the way that aircraft and operations are currently managed. One size does not fit all!

Since the operation of UAS differs greatly from manned aviation, new approaches have to be applied to both, regulation and operation – which is why this Symposium will deal with UAS in two sessions.

The first session looks at the regulatory aspects. With the Riga and the Warsaw declaration the European Commission has set the political goals for the safe integration of UAS into the airspace. EASA, with the A-NPA 2015-10 and the Prototype Regulation on UAS has taken the first step towards regulation of RPAS operations. EASA makes use of the support of JARUS for the development of the provisions that support the implementation of these rules.

Session 4: Performance Based Navigation (PBN) 16:30 - 17:35 PM

Performance Based Navigation (PBN) as a concept is based on the use of Area Navigation (RNAV) systems to ensure global standardisation of Required Navigation Performance (RNP) Specifications. It represents a fundamental shift from sensor-based

navigation to performance-based navigation. Significant benefits in terms of more efficient use of the airspace and environmental improvements are expected. However there are still some very important items to be discussed. For instance, phraseology and charting aspects, knowledge and training of flight crew, adequacy of PBN Specifications vs the needs of the end-users, ATC personnel and regulator issues, and a way to allow the General Aviation community to benefit from PBN. The means by which global navigation satellite systems GNSS (Galileo, GPS, GLONASS, BeiDou etc.) can be used within Europe, including associated signal monitoring obligations will also be discussed by the panel. The discussions will touch on the environmental and social impact of PBN with regard to the overflowed areas/populations, and the concentration of noise emissions on specific flight trajectories. The panel will debate, with a particular focus on the implementation gaps, the need for development of Navigation Specifications, and provide an outlook on the emerging technologies and their impact on industry standards development.

54th EUROCAE General Assembly: starts at 18:00
Dinner followed by the Award Night: starts at 20:00
Venue: Royal Aeronautical Society, No.4 Hamilton Place, London

DAY 2 | FRIDAY, 28 APRIL

Opening: 09:00 AM

**Session 5: Datalink services and technologies
09:00 - 10:45 AM**

Datalink services are recognised as one of the key technical enablers paving the way to the evolution of ATM in order to face the challenges ahead that are the capacity and efficiency improvements to cope with the growing traffic demand over the next decades.

The initial Datalink services (i.e. ATN B1) were standardised more than 15 years ago and are in the process of implementation in different parts of the world based on various technologies. The last package of datalink applications have been standardised in 2016: this package (i.e. ATN B2) covers the basic functionalities to move to trajectory based operations (TBO).

A ground based cellular system named LDACS that will operate in the L band spectrum part coexisting with several other CNS systems (DME, Mode S, GNSS L5/E5...). This solution is still under investigation to validate the possible sharing of this spectrum with other critical systems without degrading them.

Besides the basic radiocommunication technologies another new debate is now taking place regarding the network aspects (i.e. the capacity of the airborne system to use different technologies in a transparent way from the datalink application point of view).

The objectives of this session will be to present the current situation and to identify the major challenges ahead that are linked with the technical difficulties that have been faced during implementation in Europe and that are linked with the lack of a clear evolution roadmap regarding the technologies to be deployed (they must be minimised and they must be viable economically – for an operation life cycle of at least 25 years).

10:45 AM: Keynotes & Signature of EUROCAE-ECA Memorandum of Understanding**Session 6: UAS – technology and operations
12:15 - 13:45 PM**

This second UAS session will look at the technological and operation related aspects of the safe integration of UAS into the airspace.

In future the determination of the rules to be applied will be performed in a risk-based, operation centric

approach. With the three categories of operations (Open, Specific, Certified), a basic categorisation has already been defined.

Standardisation will be key to ensure that the same procedures and technologies are applied globally. EUROCAE WG-105 has been tasked to develop such standards for the whole spectrum of UAS aircraft and operations.

If future operations of UAS shall be successful, it is important to take into account the requirements and needs of manned aviation. Both types of airspace users have to fit into the concept of the provision of Air Navigation Services.

**Session 7: System Wide Information Management
14:00 - 15:15 PM**

System Wide Information Management (SWIM) is an enabler that facilitates interoperable information exchange in the European ATM system, in support of operational improvements identified in the ATM Master Plan. The definition of SWIM is as follows: “SWIM consists of standards, infrastructure and governance enabling the management of ATM information and its exchange between qualified parties via interoperable services”.

The implementation of SWIM will not be a big-bang replacement of the existing ATM environment, but rather an evolutionary process based on a gradual transition towards a service-oriented European ATM system. The adoption of SWIM will be flexible, fostering increased levels of collaboration within business domains and enabling supporting systems to interact in an interoperable and standardised way.

Within the SESAR programme, activities on SWIM have reached a maturity level where the first SWIM services are now ready for standardisation.

The European Commission has adopted the Pilot Common Project (PCP) regulation which includes, among others, provisions for the deployment of initial SWIM services using the related and validated SESAR Programme findings as inputs. The rule was published on 27 June 2014 in the Official Journal of the European Union. It aims to ensure that the ATM functionalities developed within the SESAR Programme are deployed in a timely, coordinated and synchronised way. It is expected that this will contribute to cost benefits for Europe’s aviation and air transport sectors, a topic the panel will discuss at length.

**15:15 PM: EUROCAE Strategy & Closing keynote
15:30 PM: End of symposium**

UK Aircraft Owners and Pilot Association (AOPA):



The Aircraft Owners and Pilot Association of the UK has been representing its members and General Aviation for more than 50 years and is an affiliated member of International AOPA which has over 450,000 members worldwide, with offices in 76 countries.

The role of AOPA is to work with Government institutions and regulatory authorities to make sure that when changes to the current environment are being proposed that GA can afford those changes. Often safety is the driving force behind many proposals but change at any cost is not affordable for GA.

After many years of seeking better regulation it is pleasing to see that European and National authorities are moving towards proportionate risk based regulations and oversight. EUROCAE, as a standards body, will play an important role in delivering risk-based proportionate standards for the future GA avionics. There are two major Global ATM modernisation programmes – **SESAR** and **NextGen**. Both of these projects are about modernisation and as aviation is a global activity so GA needs global solutions.

ICAO sets down the minimum standards (SARPs) GA is listed in ANNEX6 – MOPs (Minimum Operational Procedures)

Safety is always a priority but equally GA needs better airspace access, greater (low cost) access to regional airports and we need to reduce our environmental impact through improved efficiency (better routings) – through the airspace. Many ANSPs do not understand the performance activities of many of the business jet operators.

General Aviation encompasses a wide variety of activities from sporting and recreational flyers to turbo prop and turbine jet aircraft. The latter are mostly flying IFR, whereas the former are VFR flights. In theory, everyone should have equal rights to access the airspace but this access depends upon being able to comply with the airspace classification.

When you add in military and commercial air transport flights, managing the airspace is a demanding job. I think UK NATS is world leader in the provision of ATC particularly when you consider the UK is about half the size of France with similar aircraft numbers.

The future must be about sharing the airspace and we need technology to help. TCAS and RVSM is a good example of how technology has increased the number of flights in Europe’s airspace at the high levels - now we need solutions for all airspace users throughout all of the airspace.

EUROCAE can assist through its working groups but it may also need to examine existing standards and check if they are proportionate for the class of users. It may be time for EUROCAE to do some strategic thinking and publish what it thinks the future European airspace should look like over the next ten years – all airspace not just the Network.

Interoperability is the key for improved airspace use. Sharespace - I think I have heard that phrase before!

By Martin Robinson

EUROCAE at World ATM Congress 2017

EUROCAE actively participated at the World ATM Congress, which took place 7 - 9 March 2017 in Madrid. Under the motto "Partnering for excellence in global aviation" EUROCAE was represented on a joint stand with our partner organisations, including the European Commission, SESAR Joint Undertaking, SESAR Deployment Manager, EDA, EASA, and the Network Manager.

Whether it's tackling runway safety, passenger security, drone proliferation, a capacity crunch or the broader regulatory, social and commercial issues underlying Europe's aviation ecosystem, there is one thing for sure... partnerships and cooperation are the way forward.

"Today I think that "togetherness" is reflected in our work on the Single European Sky and approach to international cooperation. Sometimes the process of moving forward can be slow and frustrating and it might be tempting to go it alone. But we should remember that while alone we move faster, together we go further," said Henrik Hololei, Director General DG MOVE, who delivered the keynote at the opening session, **'Setting the scene - partnering for ATM excellence in global aviation'**.

In fact, 'Partnering for excellence in global aviation' is the theme for all activities taking place at the SESAR stand and theatre during the World ATM Congress.

Activities are being hosted by the SESAR Joint Undertaking (SESAR JU) and the SESAR Deployment Manager (SESAR DM) in collaboration with the European Commission, Network Manager, European Defence Agency, European Aviation Safety Agency and EUROCAE, the European leader in aviation industry standards.

SESAR and its support of the Single European Sky (SES) is recognised in the EU Aviation Strategy as key to boosting Europe's economy and securing its leading role in international aviation.



EU Commissioner for Transport, Violeta Bulc, and Spanish Minister of Public Works, Iñigo de la Serna Hernáiz, meeting with the European partner organisations for official opening of WAC Stand.

Through public-private partnerships and regional outreach, including universities, industry and experts, SESAR's unique platform is transforming Europe's vision of a SES into a reality.

Indeed, results coming out of the SESAR pipeline are already prompting uptake by all stakeholders across Europe and worldwide. This is providing better connectivity and mobility, safety and security, passenger experience, as well as meeting wider social and environmental expectations to further decarbonise our economy. The development and implementation of the solutions are also generating more jobs and growth for Europe.

Christian Schleifer-Heingärtner, EUROCAE Secretary General, said "Cooperation with our European partner organisations is essential for EUROCAE in all our activities, which include chairing and hosting the European



Christian Schleifer-Heingärtner, EUROCAE Secretary General, in 'Setting the Scene' opening panel discussing partnership as a key to success for European aviation initiatives

air traffic management standardisation coordination group (EASCG), to coordinate all standardisation and regulatory activities in ATM - a European success story and example of how we can work together for global harmonisation and worldwide interoperability."

And this partnership was visible in over the three days of the WAC, where the EUROCAE team had the opportunity to contribute to a number of sessions, either as active speakers or in the audience.

Christian Schleifer was able to listen to a high-level session, **'Towards Global Interoperability'**. Ensuring that new ATM systems around the world are harmonised and interoperable is essential if the full benefits of ATM modernisation are to be realised to the benefit of airspace users and the travelling public. This session took stock of the progress being made and discuss the key opportunities and challenges in moving our collected efforts towards achieving globally interoperable and harmonised ATM modernisation solutions, set in the context of the international dimension of the EU's aviation strategy. It highlighted the cooperation between the EU and US at different levels and the important role of the ICAO at the global level.

Luc Deneufchattel contributed to a session discussing the **'Data Link Services Recovery Plan'**, which focussed on high-quality data communications capabilities in the form of the datalink technology as essential enablers for the modernisation of air traffic control and to achieve SESAR performance benefits. The current implementation did not provide the expected results and some studies were conducted to investigate the issues, the last and most relevant is the so-called ELSA study performed under SESAR JU coordination. Luc provided information on EUROCAE activities in the past on this important subject as well as the plans to address the recommendations of the ELSA study in WG-92. These recommendations have been confirmed by the European Commission in a letter to EUROCAE.

Anna von Groote joined Peter Green, Head of Standardisation Unit, EUROCONTROL and Al Secen, Vice President for Aviation Technology and Standards, RTCA in a session entitled **'Standards facilitating change in air traffic management: the EUROCONTROL, EUROCAE and RTCA perspectives'**. The session focused on the openness, transparency and consensus-based standardisation processes and the cooperation between the organisations ensuring complementarity of the activities and avoidance of duplication and overlap.

Another session, organised by the SJU, **'CNS and Avionics: Challenges and Priorities'**, showed how the Single European Sky is fostering changes to the aviation infrastructure including moving towards rationalisation, cost reduction and more efficiency, and how SESAR is defining the future CNS environment and the level of ambition for the European ATM Master Plan. EUROCAE's process of defining the standardisation work programme in support of this vision and the collaboration with all relevant stakeholder organisations

- SESAR/R&D, regulators, industry and airspace users - as well as the important role of the EASCG in coordinating the various activities were acknowledged and welcomed by the community.

Finally, the EASCG workshop, **'Standardisation: connecting R&D achievements, industrialisation, deployment and regulation'**, presented the EASCG activities and the Rolling Development Plan. Building an efficient, sustainable and safe Single European Sky requires the modernisation of the European ATM infrastructure. To ensure a coordinated and harmonised implementation of the required ATM-related functionalities, it is essential to ensure that the necessary standards are available, in a timely fashion. The EASCG was recognised as an essential link building the bridge between R&D and deployment by coordinating standardisation and regulatory activities throughout the development process.



Luc Deneufchattel, EUROCAE, discussing the EUROCAE activities on VDL Mode 2



Anna von Groote, EUROCAE, presenting EUROCAE's principles and cooperation with our partner standardisation bodies during a session on the EUROCONTROL stand



EASCG members discussing the importance of partnership in support of ATM standardisation

Latest publications

EUROCAE Documents (ED) are developed by Working Groups bringing together renowned experts in their area, and following a well-established process. They are often developed jointly with our international partners and recognised worldwide for their high quality and as state of the art technical specifications.

These EDs can be system or equipment performance specifications, safety and performance requirements, interoperability requirements, technical specifications or guidance material. Some documents are dedicated to the airborne side, others to the ground side (mainly CNS and ATM), while others cover common air and ground requirements.

EDs are widely referenced as a means of compliance to regulatory documents by EASA, EUROCONTROL, the European Commission and ICAO.

Recent publications:

- ▶ **ED-117A** MOPS for Mode S Multilateration Systems for Use in Advanced Surface Movement Guidance and Control Systems (A-SMGCS)
- ▶ **ED-130A** Guidance for the use of Portable Electronics Devices (PEDs) on Board Aircraft
- ▶ **ED-241** Minium Operational Performance Specification For Altimetry Function
- ▶ **ED-244** UAS / RPAS Flight Crew Licensing, Skill Test and Proficiency Check Report Form






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You can find all the EUROCAE publications at:
www.eurocae.net

Membership News

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Workshop on Cybersecurity in Aviation: 31 May 2017

The EASA High Level Meeting Cybersecurity in Civil Aviation held in Bucharest (November 2016) concluded that to ensure both a level playing field and a balanced sharing of risk management, cybersecurity in aviation will require risk and performance based sectorial regulations that benefit from industry standards to the greatest extent possible. EASA and EUROCAE are jointly organising a workshop

to discuss current activities and future regulatory and standardisation needs with key stakeholders from industry, airspace users, Member States, European institutions, academia.

The Cybersecurity Workshop will be held on 31 May 2017, at the EASA premises, 100 avenue de Cortenberg, Brussels, Belgium.

▶ Please see page 7 for details about registration.

Brussels, 27 April 2018 EUROCAE High Level Meeting 2018

The High Level Meeting will discuss the role of EUROCAE in the European and Global framework, as well as the role and needs of the different Standardisation Organisations. The meeting will have a close look at the fast-developing technology in aviation, on ground and in the air, from views from the industry and service providers on the specific requirements and on the standardisation process.



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European Commission and EASA together with the industry urged that training must be developed to address the cybersecurity threat.

Stay tuned, full details will be available shortly on the EUROCAE website.

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