

ANNUAL REPORT

MAY 2019 - OCTOBER 2020



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COVID-19 crisis.

Because of the circumstances, the 2019 exercise extended well into 2020 and covers an unusually long time span, both for activities falling in the "business as usual" category and truly extraordinary activities.

The specificity of the 2019 exercise should not let us understate the amount and quality of work that EUROCAE delivered in such troubled times. In spite of the moment's hardship, EUROCAE has maintained its customary high level of activity and productivity, adapting its operational mode to the needs dictated by such particular circumstances.

Indeed, despite the worries and uncertainties of this difficult period, Eurocae enlarged its already broad scope of activities by including Artificial Intelligence, as well as means of recovery for the aviation industry, dramatically impacted by the pandemic, through WG-120 (Identification of potential COVID-19 carriers among passengers) and WG-121 (Aircraft cleaning). Forty-six WGs are currently coordinated, accompanied, and guided along their EDs development by only six Technical Programme Managers.

The dedicated staff, together with the Working Groups' achievements, allowed once more an increase of membership, this year to 340 members, and I am pleased to note that 70% of them are Full members with whom we have a long term and fruitful cooperation.

The Council, with the support of the Secretary General, has devoted large amounts of effort and time to a fundamental reflection on the future legal set-up of the organisation, in view of adapting the institutional foundation of EUROCAE to the

2019 will be remembered as an unusual exercise. At the time this report was written, 2019, which started as another productive year in the life of EUROCAE, already seemed like a distant memory, soon to be overwhelmed by the global

needs and requirements of the years to come. This work is a delicate initiative that raises many sensitive questions, which need to be addressed with great care in order to ensure that EUROCAE remains fit for its purpose. While the Council would have liked to submit a concrete proposal to the Members for approval at the GA 2020, it has preferred to prolong its work to bring the project to full maturity and ensure that all aspects of the proposal have been duly investigated and adequately addressed.

2019-2020 will also mark the completion of my last term as President of EUROCAE. I wish to seize the opportunity of this report to express my warmest thanks to all our Members, the Secretary General and his team, and to the Council, for the support, the trust and the listening throughout my presidency.

EUROCAE is an extraordinary organisation. It is your organisation, the success of which relies on the contributions from all of you, representatives of the members, the secretariat and the governance. It is the diversity of the membership, which spans across the full spectrum of the aviation industry that makes EUROCAE a unique forum to collectively elaborate authoritative standards that will support the safe and efficient development of aviation in Europe and beyond. It is with gratitude and pride that I hand-over the presidency.

The four years spent at the ceremonial helm of EUROCAE have been a fascinating and intellectually rewarding journey for me. I wish you all a safe navigation through the times to come and plenty of professional satisfaction for all those who are lucky to continue that journey.

Francis Schubert
President



I would like first to express my best wishes for this challenging times and hope that you, your families and loved ones are safe and well. I am pleased to present this report at the end of my third and therefore last year as EUROCAE Council Chair,

which reflects another successful year for EUROCAE.

Indeed, in 2019 our membership has increased again by more than 15%, bringing us now to over 340 members and a 100% growth over the last 6 years. Until now this positive trend could be maintained, thanks to many new activities launched in 2020. Nevertheless, with a clear sign of caution for the future seeing the stagnant and rather slow recovery of traffic and number of passengers in Europe and worldwide.

Regarding the Working Groups (WGs), EUROCAE has set up five new WGs, namely WG-112 Vertical Take Off and Landing, WG-113 Hybrid Electric Propulsion, WG-114 Artificial Intelligence, WG-115 Counter UAS and WG-116 High Voltage Systems and Components in Aviation. This brings us to 40 active WGs at the end of 2019.

Amongst the other achievements in 2019, we have taken benefits of the accelerated process to create and launch a new Working Group. Such optimisation gives us the possibility to act faster and more effectively to your needs, challenges, priorities, even the current COVID-19 pandemic and the requirements set by the regulator. We have further reduced the overall time to develop and publish standards, mainly by reducing the administrative part, while leaving the WGs unchanged time and flexibility for developing high quality EUROCAE standards, as we are used to since decades. These efficiency gains, improvements of the organisation over the last years are reflected also in the record number of 31 EDs published in 2019.

Last year I reported that the Council had approved a pilot project to use a so called "lean standard development process" in order to support fast growing and emerging markets, with a more agile and swift development of a set of standards to complement certification specifications with acceptable means of compliance. Together with EASA we worked on this pilot project and started to develop a set of standards for VTOLs. As mentioned above, WG-112 was launched and started to work immediately and I'm very happy to report that the first standard is already published and many others are in their final phase, either in open consultation or comment resolution. Thus, as a next step the Council will review the lessons learned from this pilot project and adapt, where needed, our current procedures as part of our continued improvement process.

Having said that, this leads me to another project completed in 2019, where EUROCAE fully implemented its quality and process management system. This was a task the Council asked the Secretariat to implement in order to ensure the high quality of our standards while keeping up with the increasing demand and pace of the industry and our members' needs.

EUROCAE has been very active in Europe and globally, here are just some of the events, where EUROCAE was actively represented and engaged:

- High-Level Conference on the Future of the Single European Sky
- NATO Workshop on the Use of Civil Standards
- World ATM Congress WAC
- Avionics Europe / Aerospace TechWeek
- 6th ENRI International Workshop on ATM and CNS (EIWAC 2019) and JAXA conference in Japan
- 3rd UAS Standard Development and Application International Forum in China

EUROCAE has currently a Grant Agreement with the European Commission, DG MOVE, in support of the Single European Sky targets related to ED developments, coordination activities for ATM,

Drones and Cyber, as well as to specifically support EASA performance based regulations and other rulemaking and international coordination activities. The Grant agreement got now extended in order to cover the European Commission, DG DEFIS, support in the area of EGNSS and the wider Space policy.

Since the initiation of the European Standards Coordination Groups in 2015, first focusing on ATM, then extended for Drones and finally to cyber security, EUROCAE was tasked by the Commission to chair and run all three coordination groups, which has put us in the center of Aviation standards, but also fully integrated us as a player in the bigger picture of the European aviation landscape.

To conclude, as my mission ends in times of unprecedented crisis for civil aviation, please allow me to address some perspectives and vision: recent months have underscored the importance of air travel and moving freely across borders. In their absence, we have been reminded of their value. Air travel brings us together across the world to learn from and understand each other; to find shared answers to our common problems, whether COVID-19, climate change or protecting people.

Air travel is the oxygen of multilateralism, diplomacy and those human values many of us took for granted in the second half of the 20th century. 2020 has shown that a less connected world is one more susceptible to a new dark age of protectionism, resurgent nationalism and geo-political instability. By bringing together people and cultures, aviation eases the tensions that can give rise to conflict.

The global aerospace sector is an engine of employment, innovation and prosperity. Before the crisis, more than one-third of global trade by value was moved by air. And aviation supported \$2700 billion of worldwide economic activity. Moreover, without air links, poorer and geographically isolated countries and regions become more disconnected, further damaging their economic prospects.

Our industry has also taken the full measure of the challenge given to humanity with the climate change and has now started the journey of the decarbonisation of the entire aviation sector. Governments in the context of their support to the economy relaunch post crisis are committed, to additional research funding to sustainable aviation.

EUROCAE today is well known, respected and represented on a global level and I am happy and honoured to handover a healthy and successful organisation to my successor.

Jean-Christophe Albouy
EUROCAE Council Chair



Dear members, colleagues and friends of EUROCAE,

This edition of the Annual Report is a bit different to the once we published the years before, first the timeframe since the last General Assembly is a year

and a half, you might remember that due to the outbreak and that we were hit by the first wave of the pandemic end of March beginning of April, we decided to cancel the Symposium 2020 scheduled end of April in Geneva, which was already under full preparation at this time. The General Assembly is required annually, so we decided to defer the General Assembly to the fall season, where we have a better understanding where this crisis will bring us and mainly to understand what the priorities are for our members. The Coronavirus crisis affects the whole world economy to an unprecedented extent, particularly the aviation and tourism sectors and therefore our members and us at EUROCAE, so we had to adapt quickly and understand potential shifts in priorities and targets.

The sanitary crisis caused by COVID-19 is hitting the aviation industry hard, and EUROCAE has seen some effects too. Whilst the standardisation activities continue with limited impact of the COVID-19 situation, the Technical Programme Manager (TPM) team is working and observing to identify potential risks related to the current but changing situation (e.g. delays caused by the unavailability of key experts, inability to hold F2F meetings, priority changes by our members...) and coordinating counter-measures in cooperation with the Working Group (WG) leadership to keep potential delays to a minimum and well managed.

The situation had significant impacts on other areas of EUROCAE activities and has resulted e.g. in the cancellation of the annual EUROCAE Symposium and as mentioned above postponement of the General Assembly, as well as the cancellation of a whole series of trainings. Due to the general strike in Paris over December 2019 and January 2020 meetings and in particular trainings were impacted because of travel and public transport restrictions

in and around Paris. After we had to cancel the second round of training courses when the coronavirus hit the first wave, we took action to switch from classroom trainings to optional online formats. This worked very well and we were able to already offer in May the first virtual cyber security training followed by the Software and UAS trainings. While we agreed to cancel the Symposium for this year, it was also agreed to defer the General Assembly to later this year, which took place on 20 October 2020. We prepared to host the General Assembly in some kind of hybrid mode with the option to join in person at the EUROCAE premises in Paris (Saint Denis), but finally we had to switch to a full virtual meeting, due to the increasing infection rates in France and Europe overall.

In this context, EUROCAE has adapted and developed its activities at an unexpected pace, striving to support our members as best as possible and delivering results for our stakeholders. As mentioned, one of our first immediate action was to adapt rapidly our way of working to accommodate virtual meetings as much and beneficial as possible. This has allowed us to progress with our standard developments which enabled most of our experts to continue our joint work, especially during the lock down.

Two examples of our reactivity must be stressed here: the development of new standards on technical means for identifying potential COVID-19 carriers amongst passengers and cabin cleaning. The first one applies to sensors, which could be used to monitor the temperature of passengers to a sufficiently high degree of accuracy, in order to highlight to the crew when a passenger presents with a fever, ideally at the aircraft door so that they can be isolated and refused permission to board the aircraft. A camera system would also allow the cabin crew to automatically check whether masks are being worn correctly. The objective of this piece of equipment would be to provide passenger reassurance, and to serve the recovery of the aviation industry, which relies on passenger confidence. An international standard would create a safe framework in which to allow passengers to board, and therefore the airlines to carry more passengers.

The second WG proposal refers to an aircraft cleaning and disinfection standard preventively for an aircraft in flight or after an occurrence. Supported by IATA as well as aircraft manufacturers, operators and other specialists in this field, it should develop guidance on the acceptable process, procedures and tasks necessary to clean an aircraft interior to meet globally recognised health industry recommendations.

As our core activities consist a lot in coordinating and collaborating with regional and international partners, European and international coordination activities have been mostly carried out through virtual means in the last months. Major events like the WAC, the RTCA symposium and Avionics Europe were cancelled and virtual alternatives have been organised. Nevertheless these new means of technology and their huge potential for providing for such alternatives, it has some limitations to it and these events and meetings cannot fully replace F2F meetings and social gatherings entirely.

Hence, I am also glad to stress once more the active participation of our members to our WGs despite these difficult circumstances and uncertainties of this period which resulted in the publication of 31 EUROCAE Documents (EDs) in 2019 and 32 EDs are expected by the end of 2020, thanks to their sustained activity.

Membership in EUROCAE remains stable and is even still growing, 15% membership increase in 2019 and 2020 seems to be close with an equal rate of growth, which is clearly linked to the relevant new standardisation activities launched during these two years. Nine new WGs launched in the last 12 months is a trend we have seen, but a record we did not expect. The long term average went from two per year to four new WGs per year, but we see that we need to be more agile, flexible, efficient but at the same time without compromising the quality of our standards and in no way safety in aviation which resulted in a total of 5 new WGs in 2019 and 7 in 2020. The demand on standards is growing and we try to develop the organisation to keep up with this pace to serve our members and the larger aviation community globally.

Many of these new WGs are addressing new technologies, newcomers in Aviation (like VTOLs and Urban Air Mobility) as mentioned above two are reactions to the COVID-19 and also some in the area of environment and sustainability in aviation. One tendency we see in this increase of members, is that more small and medium size enterprises (SMEs) are joining and a clear trend on more international members, we have increased the share of non-European members from around 30% to now 42% in the last years.

Over the last years we were competing and fighting to get the resources needed to develop the standards required to deploy, implement and roll out our modernisation and safety programmes. Now, while awaiting the full recovery of the traffic, we might have some additional resources available, thus let us use those capacities wisely and invest in the future, to develop together those standards and technologies we always put on hold due to other day-to-day priorities. Digitalisation, environmental protection and emissions, as well as capacity constraints should not be again a limiting factor when we return to a regular traffic situation - hopefully soon. We need to invest in a sustainable aviation future today, the infrastructure is available and the EUROCAE team stands ready to take our part in making aviation fit for the future and to support a fully recovered, sustainable aviation sector ensuring connectivity and global mobility.

Let me take this opportunity to thank our more than 340 members for your loyalty and support, and all our 3400 experts currently registered in one or more WG activities, that we can look back to a successful year 2019 and a well-managed year 2020, where we together with you were able react and adapt to the changing situation and join forces for a safe, sustainable and healthy recovery of aviation!

All the best to you and your families, stay safe and healthy and we look forward to get in touch with you soon.

Christian Schleifer-Heingärtner
Secretary General



WE are

a **non-profit organisation** which was founded in 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 Equipment) 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 specialised in one or several technical fields of Aeronautics and many of them are considered to be among world's leaders in their domain.

EUROCAE is governed by a Constitution and functions according to procedures resulting from **more than 50 years of experience** and expertise in the development of aviation standards.

WE do

develop technical specifications for the industry and in support of European and global regulations, aiming to increase safety, market potential, facilitate interoperability and encourage technological development in the interest of its European and global stakeholders.

To develop EUROCAE Documents (EDs), EUROCAE organises Working Groups (WGs) to which members delegate experts working on a voluntary basis. In general WG members come from the association membership.

The development of EUROCAE Documents is governed by a well-proven core process promoting team work, excellence, industry buy-in and consensus while ensuring safety.

To date, EUROCAE **has published more than 250 EDs**, which are recognised worldwide as high quality and state-of-the-art standards.

WE have

put in place a unique structure, **the Technical Advisory Committee (TAC)**, which brings together leading experts of all stakeholder categories represented in aviation. The role of the TAC is to monitor the consistency and coherence of the EUROCAE strategic work programme and to advise on ongoing and future activities.

Over **3.000 experts** designated by EUROCAE Members are currently collaborating in **46 active Working Groups** to revise or develop future EDs.

EUROCAE currently has over **340 members**, with full or limited membership, including manufacturers, service providers, regulators, research institutes and international organisations. EUROCAE membership is open to organisations and industries worldwide.

EUROCAE has a **100% Subsidiary "EUROCAE Communication"**. This limited liability company, financially and legally independent from the Association, is dealing with four commercial activities:

- ▶ **Sales of ED documents.**
- ▶ **Contracts with external companies** (covering engineering studies and/or services in relation with EUROCAE's domains of activities, etc.).
- ▶ **Event organisation.** It concerns dedicated technical workshops, symposia (such as the EUROCAE annual Symposium, usually accompanying the General Assembly) and conferences.
- ▶ **Training,** in cooperation with the best experts in their fields to provide with high-quality training courses.
- ▶ EUROCAE is governed by an elected Council and managed by a General Secretariat headquartered in the Paris area, France. Council members, sponsored by their respective organisations, are elected and nominated during the annual EUROCAE General Assembly.

COUNCIL May 2019 - October 2020

The Council is made up from not less than 8 and not more than 20 members and had for the exercise 2019-2020, 18 members elected by the EUROCAE Full Members at the General Assembly. The Secretary General is the Council Secretary. At its first meeting (usually immediately after the General Assembly), the Council elects its Chairperson, two Vice-Chairpersons and the Treasurer. The main role of the Council is:

- ▶ to define the strategic objectives, policy, business plan and associated annual budget for EUROCAE and to periodically review the progress thereto;
- ▶ to approve the appointment of the Secretary General, contracts, agreements, and any expenses outside the budget, and to supervise the administration of the EUROCAE Association by the Secretary General;

- ▶ to appoint the Technical Advisory Committee Chairperson, its members; to set its objectives and approve its outputs;
- ▶ to approve the set up or continuation of Working Groups, the strategic part of the terms of reference, and the publication of EUROCAE Documents;
- ▶ to monitor and, when required, to support the supervision of Working Group activities;
- ▶ to agree the subscription ceiling for the following year that is submitted to the General assembly and to approve the membership fee categories below the approved ceiling.

The Council meets at least four times a year, normally at the EUROCAE premises. Council members consider the interest of the whole EUROCAE membership when executing their function.

EUROCAE PRESIDENT

Francis SCHUBERT / SKYGUIDE - SWISS AIR NAVIGATION SERVICES

COUNCIL OFFICERS

Jean-Christophe ALBOUY / AIRBUS OPERATIONS / Chairperson
 Peter GREEN / EUROCONTROL / Vice-Chairperson
 Michael HOLZBAUER / FREQUENTIS / Vice-Chairperson
 Bruno AYRAL / THALES LAS FRANCE / Treasurer



COUNCIL MEMBERS	ORGANISATION
David BOWEN	SESAR JU
Eric BOUCHARD	DASSAULT AVIATION
Phillip CHURCH	HELIOS
Giuliano D'AURIA	LEONARDO
Pierre GEORGES	GIFAS
Iain HARRIS	NATS
Regina KLOTZ	LUFTHANSA TECHNIK
Pascal MEDAL	EASA
Michael MOWINSKI	FRAPORT
Pierre NOËL	THALES GROUP
Francisco SANCHEZ ROMERO	INDRA SISTEMAS
Patrick SOUCHU	DSNA
Marc VENIER	COLLINS AEROSPACE
Frank ZETSCHKE	DFS

New COUNCIL

COUNCIL OFFICERS

Bruno AYRAL / THALES LAS France / Chairperson and President
 Phillip CHURCH / HELIOS / Vice-Chairperson
 Michael HOLZBAUER / FREQUENTIS / Vice-Chairperson
 Peter GREEN / EUROCONTROL / Treasurer



GA 2020: ELECTED COUNCIL MEMBERS:

COUNCIL MEMBERS	ORGANISATION
Jean-Christophe ALBOUY	AIRBUS Operations
Bruno AYRAL	THALES LAS France SAS
Eric BOUCHARD	DASSAULT AVIATION
Phillip CHURCH	HELIOS
Giuliano D'AURIA	LEONARDO SpA
Bernard FABRE	THALES GROUP
Pierre GEORGES	GIFAS
Peter GREEN	EUROCONTROL
Iain HARRIS	NATS
Michael HOLZBAUER	FREQUENTIS AG
Peter HOTHAM	SESAR JU
Philippe LAGARDE	SAFRAN
Stéphane MARCHÉ	HONEYWELL AEROSPACE
Pascal MEDAL	EASA
Michael MOWINSKI	FRAPORT AG
Guillaume ROGER	DGAC / DTA / STAC
Francisco SANCHEZ ROMERO	INDRA SISTEMAS
Patrick SOUCHU	DSNA
Marc VENIER	COLLINS AEROSPACE
Frank ZETSCHKE	DFS GmbH

Technical Advisory Committee (TAC)

April 2019 - May 2020

CHAIRPERSON: Eric BOUCHARD / DASSAULT AVIATION
VICE-CHAIRPERSON: Jean-Marc LOSCOS / DSNA

The Technical Advisory Committee (TAC) advises the Council on technical, operational and, on request, on policy matters. TAC is a specific body, composed of 12 specialist members representing the different groups of stakeholders. The Secretariat is also a key participant in the TAC, complementing the overall perspective and ensuring a tight link with the Working Groups. TAC ensures that prospective work aligns with EUROCAE members' interests from the outset, guaranteeing a high technical quality of the standards, fit for purpose and available when needed.

TAC gives advices to the Council and provides technical recommendations on standardisation activities. It elaborates and maintains the EUROCAE Technical Work Programme, as the core guideline for future EUROCAE activities.

As it includes representatives of key European aeronautical organisations, TAC is well-placed to ensure alignment of EUROCAE activities with external entities and regulatory bodies. It places activities within the context of European SES developments and coordinates transatlantic efforts with our main partner organisations in support of ICAO roadmaps and global interoperability.



TAC MEMBER	ORGANISATION
Laurent AZOULAI	AIRBUS
Cédric CHEVREL (until Oct 2019) Denis RICAUD (since Oct 2019)	THALES GROUP
Robin DAVIES	BAE SYSTEMS
Robin GARRITY	SESAR JU
Manfred MOHR	IATA
Sasho NESHEVSKI	EUROCONTROL
Roy POSERN	FRAPORT
Sylvain POUILLARD	SAFRAN ELECTRONICS & DEFENSE
Michel PROCOUDINE-GORSKY	THALES LAS FRANCE
Friedhelm RUNGE (until Jan 2020) Hette HOEKEMA (since Feb 2020)	EASA
Christian SCHLEIFER	EUROCAE

Technical Advisory Committee (TAC)

May 2020 - October 2021

CHAIRPERSON: Eric BOUCHARD / DASSAULT AVIATION
VICE-CHAIRPERSON: Jean-Marc LOSCOS / DSNA

TAC MEMBER	ORGANISATION	REPRESENTING
Laurent AZOULAI	AIRBUS	Aircraft Manufacturers - Commercial aviation
ERIC BOUCHARD	DASSAULT AVIATION	Aircraft Manufacturers - Business aviation
Denis RICAUD	THALES GROUP	Equipment manufacturers - Avionics
Robin DAVIES (†) *	BAE SYSTEMS	Equipment manufacturers - Aircraft Non Avionic
Robin GARRITY	SESAR JU	European R&D community
Jean-Marc LOSCOS	DSNA	Air Navigation Service Providers
Manfred MOHR	IATA	Airlines / Airspace users
Sasho NESHEVSKI	EUROCONTROL	European ATM Organisation
Roy POSERN	FRAPORT	Airports
Sylvain POUILLARD	SAFRAN ELECTRONICS & DEFENSE	UAS
Michel PROCOUDINE-GORSKY	THALES AIR SYSTEMS	Equipment manufacturers - Ground Equipment
Hette HOEKEMA	EASA	Regulatory Authority
Christian SCHLEIFER	EUROCAE	EUROCAE

IN MEMORIAM

ROBIN DAVIES



It is with great sadness that we learned over the summer about the passing of our very dear colleague, Robin Davies.

His sudden death at an early age leaves a large gap to fill.

Robin was one of the longest-serving TAC members, representing the equipment manufacturers (aircraft non avionic) since 2006. He also held the Chair of Working Group 96 Wireless on-board avionics network since its creation in 2013. Many a time, his poise and

calm attitude was instrumental in defusing sometimes heated debates. Robin was always a good companion in the many cities where the TAC work and aviation standardisation lead our steps. He will be greatly missed by the Secretariat, TAC members and those of the EUROCAE community who had the chance to work with him.

EUROCAE Domains of Activity

AVIONICS (NON-CNS)

This domain encompasses all standardisation activities which are related to on-board equipment and systems without those in interaction with the external world (which are part of the CNS Domain). In addition, this Domain also encompasses standardisation activities related to the various system development activities.

CNS (Communication, Navigation, Surveillance, Datalink Applications)

This domain encompasses all standardisation activities which are related to on-board and ground equipment and systems which are in interaction with the external world for Communications, Navigation and Surveillance (CNS). Activities related to Datalink are also considered as part of this Domain.

ATM (AIR TRAFFIC MANAGEMENT)

The following EUROCAE activities are concerned by the ATM Domain:

- ▶ Flight Data Processing (FDP) Interoperability
- ▶ Voice over Internet Protocol (VoIP) for ATM
- ▶ Interoperability of ATM Validation Platforms

AIRPORTS

As airports are an important stakeholder in the ATM system, it is necessary to facilitate the integration of airports in the ATM system in support of the European concept of operations. In addition, airports are also key economical players in their region where modernisation of their infrastructure is expected together with their expansion.

SWIM (SYSTEM WIDE INFORMATION MANAGEMENT)

Through the SESAR programme, Europe has made great progress on defining, developing and validating SWIM.



SECURITY

The Aeronautical Information Systems Security (AISS) activity addresses the cyber security concerns for Aeronautical Information Systems (AIS) within aircraft as much as their supporting infrastructure and supply chain.

AERONAUTICAL INFORMATION SERVICES (AIS) / METEOROLOGICAL (MET) SERVICES

The scope of the activities within this domain includes the establishment of user requirements for aeronautical data as well as standard generic data format for the transfer of geographic information/ data in digital form between different users, systems and locations.

AIRCRAFT ELECTRICAL SYSTEMS

This Domain encompasses all standardisation activities which are related to energy management of aviation needs, e.g.

- ▶ Hydrogen & Fuel Cell Systems
- ▶ Hybrid Electric propulsion
- ▶ HIGH VOLTAGE - POWER DISTRIBUTION

ARTIFICIAL INTELLIGENCE (AI)

AI technologies are developing fast and appear to become accessible, providing attractive future capabilities for aviation, thanks to the significant increase of processing power in the recent years, enabling machine learning and computing.

UAS, VTOL & GENERAL AVIATION

It has been realised that the specific needs of general aviation have been left aside when developing or updating the aviation system. Now it has been recognised that several activities are on their way to adopt some systems and regulations better to the needs of the GA community. A similar situation exists for the integration of Unmanned Aircraft Systems (UAS). The integration of those aircraft into the existing ATM system needs industry standards to achieve worldwide harmonisation.

MISCELLANEOUS

The scope of this Domain is to accommodate activities which do not fit 100% into other domains, but are clearly within the scope of EUROCAE, such as

- ▶ Electronic Flight Bag (EFB)
- ▶ Space / space-based ATM systems
- ▶ Counter UAS
- ▶ COVID-19 related activities.

EUROCAE Partners

At EUROCAE, our goal is to maintain the standardisation process relevant and dynamic, aligned with the latest developments of the industry and in support of our stakeholder community. To achieve this goal, we work closely with our European and international partners for a consistent approach to standardisation.

Furthering our outreach and building a strong relationship and long-term cooperation with key partners are part of our strategic goals.

Implementing this strategic target given by the Council in the Business Plan, EUROCAE concluded the following agreements:

- ▶ **General Aviation Manufacturers Association (GAMA)**, signed 23 June 2020
- ▶ **AIDA: Japan Aviation Innovation Development Association (AIDA)**, signed 3 September 2020

In addition, several agreements were reviewed and are being updated to ensure their continued relevance.



EUROCAE MAINTAINS AGREEMENTS WITH THE FOLLOWING ORGANISATIONS:

- ▶ **Airports Council International Europe (ACI Europe)**
Memorandum of Understanding
- ▶ **ASD-STAN**
Memorandum of Understanding
- ▶ **Civil Air Navigation Services Organisation (CANSO)**
Memorandum of Understanding
- ▶ **European Committee for Standardisation (CEN, ESO*)**
Memorandum of Understanding
- ▶ **European Committee for Electrotechnical Standardisation (CENELEC, ESO*)**
Memorandum of Understanding
- ▶ **European Aviation Safety Agency (EASA)**
Framework Contract & specific activities in support of EASA activities
- ▶ **European Cockpit Association (ECA)**
Memorandum of Understanding
- ▶ **European Telecommunications Standards Institute (ETSI, ESO*)**
Cooperation Agreement
- ▶ **EUROCONTROL**
Cooperation Agreement
- ▶ **General Aviation Manufacturers Association (GAMA)**
Memorandum of Understanding
- ▶ **International Council of Aircraft Owner and Pilot Associations (IAOPA)**
Memorandum of Understanding
- ▶ **International Air Transport Association (IATA)**
Memorandum of Understanding
- ▶ **International Civil Aviation Organisation (ICAO)**
Memorandum of Understanding
- ▶ **International Federation of Air Traffic Controllers' Associations (IFATCA)**
Memorandum of Understanding
- ▶ **Japan Aviation Innovation Development Association (AIDA)**
Memorandum of Understanding
- ▶ **RTCA**
Memorandum of Cooperation
- ▶ **SAE**
Memorandum of Cooperation
- ▶ **SESAR Joint Undertaking**
Memorandum of Cooperation
- ▶ **SESAR Deployment Manager**
Memorandum of Cooperation

* ESO: European Standardisation Organisation

EUROCAE and GAMA confirm closer partnership

At the 306th meeting of the EUROCAE Council, the Council approved a Memorandum of Understanding between EUROCAE and the General Aviation Manufacturers Association (GAMA).

GAMA is an international trade association representing over 100 of the world's leading manufacturers of general aviation aeroplanes, rotorcraft, engines, avionics, and related equipment.

Its members also manage fleets of aircraft, airport fixed-based operations, pilot training and maintenance facilities worldwide. GAMA's mission is to foster and advance the general welfare, safety, interests and activities of general and business aviation throughout the world. In addition, it represents VTOL manufacturers, one of the newer and very active entrants in aviation. These issues directly relate to EUROCAE's WG-112 activities. GAMA initiatives include promoting a better understanding of general aviation manufacturing, maintenance, repair and overhaul, and the important role these industry segments play in economic growth and opportunity, and in serving the transport needs of communities, companies and individuals.

GAMA joined EUROCAE as a full member in late 2019 and is already actively contributing or planning to contribute in the near future to the following WGs. GAMA is bringing unique and valuable expertise to the following working groups:

- ▶ **WG-14** Environment
- ▶ **WG-28** Ground Based Augmentation Systems (GBAS)
- ▶ **WG-31** Lightning
- ▶ **WG-49** Mode S Transponders
- ▶ **WG-51** Automatic Dependent Surveillance-Broadcast (ADS-B)
- ▶ **WG-63** Complex Aircraft System
- ▶ **WG-71** FAS User Group Forum on Aeronautical Software
- ▶ **WG-72** Aeronautical Systems Security

- ▶ **WG-75** Traffic Alert and Collision Avoidance System
- ▶ **WG-79** Enhanced Vision System (EVS) / Synthetic Vision System
- ▶ **WG-82** New Air-Ground Data Link Technologies
- ▶ **WG-96** Wireless On-Board Avionics Networks
- ▶ **WG-110** Helicopter Terrain Awareness Information System
- ▶ **WG-112** Vertical Take Off and Landing
- ▶ **WG-113** Hybrid Electric Propulsion
- ▶ **WG-117** Topics on Software Advancement

The strengthening of EUROCAE's relationship with the General Aviation (GA) community is an important objective and the inclusion of GAMA as a full EUROCAE member together with our Memorandum of Understanding (MoU) represents a very positive step towards a better consideration of the perspectives of this important stakeholder group within EUROCAE.

The MoU will allow EUROCAE to engage with the general aviation manufacturers' community and to raise the awareness of our standardisation activities. GAMA will be able to promote the perspective of general aviation manufacturers in the standards development process. Strengthening the cooperation with associations like GAMA is a key objective of EUROCAE to further enhance the spectrum and quality of the EUROCAE activities and resulting standards, where we see many more opportunities for the GA community to benefit.



The Memorandum of Understanding was signed on 23 June 2020 by Christian Schleifer, EUROCAE Secretary General, and Kyle Martin, Vice President, European Affairs.



EUROCAE and Japan Aviation Innovation Development Association (AIDA) sign MoU

Building on our stakeholder engagement plan and the associated visits to Japan over the last few years, the Japan Aviation Innovation Development Association (AIDA) and EUROCAE have agreed to work together on developing aviation industry standards. On 3 September 2020, EUROCAE and AIDA signed a Memorandum of Understanding, (MoU) that enables the two organisations to work together to enhance collaboration between the Japanese aviation community and the EUROCAE standardisation activities. The MoU will help to speed up the implementation of new technologies.

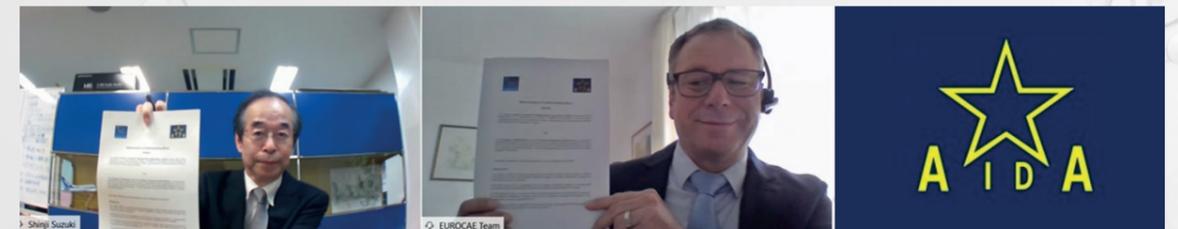
The MoU provides a framework for cooperation between our organisations. As a first step, AIDA joined EUROCAE as a Full Member earlier in 2020 in recognition of the efforts of both organisations to enhance aviation and promote strong cooperation in developing global industry standards.

"AIDA considers collaboration with EUROCAE is important because innovations, especially the ones for aviation safety, can be achieved by global expert collaboration and EUROCAE leads such collaboration," said Professor Shinji Suzuki, University of Tokyo Aviation Department and founder of AIDA.

AIDA is already actively involved in the EUROCAE Working Groups on Artificial Intelligence (AI) and Unmanned Aircraft Systems (UAS) and will join other working groups in the future.

AIDA started activities in October 2018 with the aim of promoting aviation innovations covering all aspects of aviation including activities such as aviation technology, policy and industry. It is led by Prof Suzuki (University of Tokyo). Today, it brings together all major players in Japan, including 30 world-leading companies and organisations.

For EUROCAE, working with AIDA and the increasing numbers of Japanese partners is a great opportunity. This collaboration provides a chance to gain insight into each other's work and priorities, and ensure the voice of the Japanese aviation community is heard in our standardisation activities. Developing internationally recognised standards is one of EUROCAE's prime objectives and these standards can only be truly global if they result from inputs of all concerned stakeholders worldwide.



Professor Shinji Suzuki, University of Tokyo Aviation Department and founder of AIDA, and Christian Schleifer-Heingärtner, Secretary General, EUROCAE, at the virtual signing ceremony.

EUROCAE and RTCA continue to collaborate

EUROCAE and RTCA have a long-standing collaboration. Around 50% of our activities are carried out jointly, resulting in technically identical ED and DO standards. This collaboration greatly contributes to international harmonisation and global interoperability.

The annual coordination and working meeting between EUROCAE and RTCA took place at the EUROCAE premises in Saint Denis on 20-21 November 2019.

The RTCA team was composed of RTCA President & CEO Terry McVenes, Vice President Technology and Standards, Al Secen, Steve Brown, RTCA Chair, and Chris Hegarty, Program Management Committee (PMC) Chair.

The EUROCAE team was composed of the EUROCAE Secretary General, Christian Schleifer, Anna von Groote, Director Technical Programme, Alex Engel, EUROCAE liaison, Jean-Christophe Albouy, EUROCAE Council Chair and Eric Bouchard, Technical Advisory Committee (TAC) Chair.

This meeting is a cornerstone in the implementation of our Memorandum of Cooperation (MoC) and the management of the collaboration between RTCA and EUROCAE.

It offers a prime opportunity for an in-depth discussion on current and future joint activities, policy-related subjects as well as relationship with other organisations, such as our respective contributions to ICAO activities.

All participants recognised the unique partnership, the importance of coordination between RTCA and EUROCAE, and the value this coordination brings to the aviation community, while aiming for international harmonisation and global interoperability.



ICAO-EUROCAE Collaboration

Over the 2019/20 year, the working relationship between EUROCAE and the International Civil Aviation Organisation (ICAO) has continued to grow.

EUROCAE was formally accepted by ICAO as an "International Organisation" in 2014. As an "International Organisation" EUROCAE's expertise is recognised and our participation is formally sought, and accepted by ICAO in its processes of developing international aviation Standards and Recommended Practices.

Since our first full participation in an ICAO working Panel, (Remote Piloted Aircraft Systems, RPAS),

we have worked hard to increase the visibility of the EUROCAE profile in ICAO processes and formal documentation. Discussions with ICAO about working arrangements to further expand referencing EUROCAE documents in ICAO documents are ongoing.

Our efforts in promoting a more active relationship with ICAO resulted in the development and signing of a EUROCAE/ICAO Memorandum of Understanding (MoU) in December 2017.

The ICAO/EUROCAE MoU is our primary guide to joint activities. However, the most important domestic link for our activities involves the

coordination of the European ICAO ATM Coordination Group (EIACG).

Some of the activities EUROCAE has participated in during the 2019/20 year are as follows.

STANDARDS ROUND TABLE (SRT)

During the 13th ICAO Air Navigation Conference (ANC 13), held in October 2018, a meeting of the Standards Round Table (SRT) was convened. At the meeting it was suggested that Standards Developing organisations such as EUROCAE would contribute to an **"ICAO Standards Development Plan"**. This proposal has led to, and if successful, will continue to lead to significant EUROCAE input to ICAO standards.



The last meeting of the SRT took place in Montreal on 25 September 2019. The meeting was chaired by Steve Creamer, ICAO Director Air Navigation Bureau (D/ANB) and was attended by SDOs, ARINC, OCG, RTCA, SAE and EUROCAE. The meeting was also attended by the President of the ICAO Air Navigation Commission (ANC), representatives of the U.S FAA, the Japan Civil Aviation Bureau (JCAB), EASA, the European Commission, SESAR JU and EUROCONTROL.

The meeting agreed a terms of reference for the project which aims to develop a common road map for the creation of international aviation standards which reflect the expertise, desires and priorities of not just one international body, but many. At the meeting each of the SDOs pre-

sented their current and future work programmes specifically highlighting areas where ICAO and the SDOs can benefit from each other's products, knowledge and expertise.

A joint proposal by the European Commission, EASA, EUROCONTROL, EUROCAE, and supported by the U.S FAA was made to the meeting. The proposal suggested that where regional or national standards development programs can demonstrate that they are linked or harmonised with ICAO GANP and GASP criteria, and they are proposing draft SARPs, they can be entered directly into the ICAO SARPS approval process. This proposal was based on the ICAO "camera ready" concept, and was very well received and widely accepted by the ICAO Secretariat staff that will now be working on the necessary internal procedures to facilitate the implementation of the proposal.

The SRT meetings have in general been very positive for EUROCAE and not only highlight the effectiveness of our working relationship with ICAO, but also highlights the effectiveness of the relationship that EUROCAE has, and continues to develop with the EC, EASA and EUROCONTROL more regional solutions which could be offered globally.

ICAO ASSEMBLY

EUROCAE was invited by ICAO to participate in the 40th Session of the ICAO Assembly. The Assembly took place in Montreal in September/October 2019, the year of the ICAO 75th anniversary. The overall theme of the Assembly was to reemphasise the organisations five strategic objectives:

- Safety,
- Capacity and Efficiency,
- Security and Facilitation,
- Economic Development, and
- Environmental protection.

As an ICAO Recognised International Organisation as well as a recognised Standards Development Organisation (SDO) EUROCAE had official observer status at the Assembly.



At the Assembly the EUROCAE focus was on the workings of the Technical Commission and some specific items of the Executive Commission. We took these opportunities to gain input to the EUROCAE Technical Work Program (TWP) and also to map each other's work programmes with a view to further facilitating the closer, hand in hand, Standards Development process that is outlined in the section of this report titled, "Standards Round Table" (SRT).

ICAO EUROPEAN and NORTH ATLANTIC OFFICE, (EUR/NAT) PARIS.

In September 2018, EUROCAE was invited to join the ICAO EUR/NAT System Wide Information Management (SWIM) project team. This has been an ongoing EUROCAE commitment.

In September 2019, EUROCAE met with Silvia Gehrler, the then newly appointed, Regional Director of ICAO EUR/NAT Paris. The objective of the meeting was to present EUROCAE's general interest and capabilities.

In December 2019 EUROCAE was invited to join ICAO's European Aviation System Planning Group (EASPG). At our first meeting we gave a general presentation focusing on innovation and EUROCAE activities.

In February 2020, and as a direct result of our September 2019 meeting with the Regional Director ICAO EUR/NAT, Silvia Gehrler, EUROCAE met with EUR/NAT Regional Office staff. This meeting gave us a good opportunity for more in depth conversations about specific technical issues of interest to both organisations.

ICAO DRONE ENABLE WORKSHOP

From 12 to 14 November 2019, EUROCAE participated in the ICAO Drone Enable Workshop. EUROCAE Secretary General, Christian Schleifer presented the activities of EUROCAE unmanned aircraft systems (UAS) Working Group (WG)-105. The presentation outlined EUROCAE Standards that are currently available and also those Standards being developed, it also provided a strong focus of EUROCAE activities in support of UAS Traffic Management (UTM), also known as U-Space solutions.

The workshop brought together key international stakeholders from government, industry and academia. It enabled an active exchange of information about research, best practice, lessons learned and respective challenges. This information provided a clear picture of current commercial and non-commercial activities in this rapidly evolving sector of the aviation industry and helps EUROCAE stay up to date with international developments and Standards development.

ICAO "ANC Talks"

The ICAO Air Navigation Commission (ANC) has instigated an industry consultation programme called "ANC Talks". This programme allows ICAO and international aviation organisations to openly discuss matters of mutual interest.

In September 2020, EUROCAE was invited by the ICAO ANC to participate in an online "ANC Talks" event, and as a recognised SDO, present on how international standards development can support global aviation harmonisation and interoperability.



In June already held an ICAO ANC talks with EASA on "As innovation grows, so does aviation"



Engagement with ICAO's regional offices is another important aspect of our work.

The EUROCAE presentations covered a relatively large number of topics, including:

- ▶ Runway Weather Information Systems (RWIS) – implementation of the ICAO Global Reporting Format (GRF)
- ▶ VTOL standards complementing the regulatory framework.
- ▶ Remote and Virtual Tower – innovations driven by industry.
- ▶ Cyber Security – Standards provide the "How to comply"

Again, we finished our presentations by re-emphasising our willingness and ability to cooperatively contribute to global aviation standards development.



ICAO ASIA AND PACIFIC OFFICE (APAC) BANGKOK (APAC/RO)

Also in September 2020, EUROCAE was invited by the ICAO APAC Regional Director, Arun Mishra to participate in the fifth meeting of Surveillance Implementation Coordination Group (SURICG). SURICG focuses on surveillance implementation in the Asia Pacific region. The meeting was held online and involved more than 90 participants. EUROCAE presentations covered a number of issues including, ADS-B GEN-SUR SPR, INCS systems, A-SMGCS, AIS/MET and others. These systems were described as an overview to how EUROCAE standards can support operational implementation of surveillance, also in the APAC region. We also extended an invitation to experts from the APAC region to participate in EUROCAE standards development processes.

As a direct response to our presentations at the SURICG meeting we were invited in October 2020 to an online meeting with the staff of the ICAO APAC Bangkok Office. The meeting focused quite specifically on how EUROCAE activities may be able to assist the ICAO APAC/RO in their role.

An example we gave was the implementation of ICAO provisions in the form of EUROCAE developed, ICAO sanctioned SARPs.

EUROCAE response to Covid situation: Working to support of the industry in the COVID-19 crisis

In early 2020, global aviation activities were suddenly brought to a halt by the COVID-19 pandemic. This virus spread rapidly and has resulted in outbreaks and fatalities worldwide. To stop the further spread of the disease, travel restrictions, sanitary measures as well as a more or less complete shut-down of the global economy were imposed.

Entire fleets of aircraft were grounded, empty airport terminals were shut down and air traffic decreased by over 90% as travel came to a complete halt in the first half of 2020. Predictions for recovery vary in optimism, but all foresee several years before again reaching the traffic levels of 2019. Large state-aid programmes have been established to support the global aviation industry.

As the 2020-21 Annual Report is now being prepared in the fall of 2020, EUROCAE observes with great preoccupation the impact of the COVID-19 disease on the aviation sector. The impact, which is visible in all areas of the business, is resulting in an existential threat to the future of the global aviation industry.

In response to the COVID-19 pandemic EUROCAE was able to immediately shift all WG activities to full virtual mode, supported by our robust IT infrastructure. The EUROCAE team is very active and maintaining a high level of engagement in support of our members and the ongoing standardisation activities. Meetings are supported with online solutions in addition to the usual Working Group coordination activities. Despite some shortcomings such as experts being unavailable, member organisations changed priorities, and the inability to meet in person to discuss the more challenging topics, the impact on our current activities, has so far, been relatively limited.



Next to the obvious immediate economic shock for the industry, COVID-19 might have longer-term consequences, e.g. if it delays the introduction of new technologies. On the other hand, it might offer opportunities as resources become available which were previously used on other projects.

Looking ahead, the community is starting to define strategies about how to move on and develop post-COVID-19 business activities. Some of these strategies are looking at opportunities this hard reset might offer. Some of the pre-COVID-19 priorities might need to be re-evaluated as issues have shifted dramatically.

EUROCAE has been able to rapidly initiate activities aimed at facilitating recovery of the aviation sector, such as on aircraft cleaning and disinfection or the thermal recognition of passengers potentially carrying COVID-19. Other areas of potential standardisation activities are under review.

Coordination is also continuing in close contact with our partners. EUROCAE is maintaining a close contact with the stakeholders to ensure that when industry activity restarts, we are well positioned to accelerate the standards developing process and deliver on our commitments swiftly.

Standards will always be essential and key to ensuring technological progress and the level of safety needed to support aviation today and tomorrow. Thus, the EUROCAE system and our staff will fully support the remote participation of Working Group meetings so they can continue their standards development activities until the restrictions ease.

Our aim is to respond quickly and effectively to the changing demands being brought about by the COVID-19 pandemic. We are observing the developments very carefully, will adapt our response accordingly, and keep you posted with the relevant information on our website, via the NEWSblog and our other regular communication channels.

Whilst capacity limitations are not a prime driver for the next few years, the ATM network's resilience, achieved through automation, digitalisation, efficiency, flexibility, new technologies, and the impact on the environment will become more prominent. This may also lead to a shift in the standardisation needs as perceived by the industry. The 2021 version of the Technical Work Programme (TWP) attempts to anticipate this shift in activities in line with inputs received from the various stakeholders.



Standards Development – WG Activities

EUROCAE's core activity is the development of internationally recognised aviation standards. Regulators and industry alike have expressed their appreciation of the open, transparent and consensus-based process of developing EUROCAE standards. They acknowledge the high quality of our work and the fact that our standards are recognised and applied worldwide.

Since May 2019, EUROCAE has launched 11 new Working Groups (WGs), bringing the total now to 46 active WGs which have published over 30 standards in 2020, a record in our history.

19 of these WGs are joint with RTCA (our Standard Developing Organisation (SDO) partner based in the US) Special Committees (SC), and another 4 work jointly with SAE (another US SDO partner) committees. This collaboration is extremely valuable for the quality, global recognition, and applicability of our standards.

Details on each of the WGs and their activities are provided below.

The progress made by WGs towards the completion of their deliverables is well monitored through key performance indicators, which are presented to the Council twice per year.

In case of divergences from the target dates, the Secretariat staff, together with the Council and Technical Advisory Committee (TAC), take appropriate action, depending on the nature, cause and criticality of the delay.

The following indicators are measured:

WG progress against TOR targets

- ▶ Measuring the WGs performance to achieve the target dates for their deliverables
- ▶ Target > 90% on target
- ▶ Result: constantly exceeding the 90% target (last measure: 92%).

ED publication delay

- ▶ Measuring the Secretariat performance to publish the EDs without undue delay once approved by the Council
- ▶ Target: publication within 1 week after approval, excluding external factors
- ▶ Result: the performance increased immensely from 1.5 months 2 years ago, to under one week (6.9 days) on average nowadays
- ▶ Usually, documents are now published within a few days after Council approval. Exceptional cases, where longer delays are observed, occur in peak periods of activity or some external factors, like synchronised publication dates with RTCA/SAE.

ED periodic reviews

- ▶ Ensuring a 5-yearly periodic review of all published EDs and ERs to ensure their continued relevance and quality
- ▶ Target: 100% of relevant EDs reviewed
- ▶ Result: The periodic review of all EDs published 5 years ago was carried out and completed by the TAC in January 2020.

In conclusion, the overall performance is therefore considered to be very good, thanks to the hard work and dedication of the WG leaders and participants.

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New WGs since May 2019

Active Working Groups

Working Group List

WG	TITLE	DOMAIN
WG-14	Environment	Avionics - Environment
WG-28	Ground Based Augmentation Systems (GBAS)	CNS - Navigation
WG-31	Electromagnetic hazards	Avionics - Environment
WG-41	A-SMGCS	Airports
WG-44	Aeronautical Databases	AIS/MET - Databases
WG-49	Mode S Transponders	CNS - Surveillance
WG-51	Automatic Dependent Surveillance - Broadcast (ADS-B)	CNS - Datalink
WG-59	Flight Data Processing (FDP) Interoperability	ATM - Flight Data Processing
WG-62	GALILEO	CNS - Navigation
WG-63	Complex Aircraft Systems	Avionics - System Safety Assessment
WG-67	Voice on Internet Protocol (VoIP) for ATM	ATM - Intercommunications
WG-72	Aeronautical Systems Security	Security
WG-75	Traffic Alert and Collision Avoidance Systems (TCAS)	Avionics - Safety systems
WG-76	AIS/MET Datalink Services	AIS/MET - Databases
WG-78	Standards for Air Traffic Data Communications Services	CNS - Datalink
WG-79	Enhanced Vision Systems (EVS), Synthetic Vision System (SVS)	Avionics - Approach & Landing Systems
WG-80	Hydrogen and Fuel Cell Systems	Miscellaneous
WG-81	Interoperability of ATM Validation Platforms	ATM - Simulators
WG-82	New Air-Ground Data Link Technologies	CNS - Communication
WG-83	Airport Foreign Object Debris (FOD) Detection Systems	Airports
WG-85	4D Navigation	CNS - Navigation
WG-88	Onboard Weight and Balance Systems	Avionics - Safety systems
WG-92	VDL Mode 2	CNS - Communication
WG-95	In-flight ice detection systems	Avionics - Sensors & displays
WG-96	Wireless On-Board Avionics Networks	Avionics - Architecture & Network

WG	TITLE	DOMAIN
WG-97	Interoperability of virtual avionic components	Avionics - System Engineering
WG-98	Aircraft Emergency Locator Transmitters	Avionics - Safety systems
WG-100	Remote & Virtual Tower (RVT)	Airports
WG-101	Runway Overrun Awareness and Alerting System	Avionics - Approach & Landing
WG-102	GEN-SUR SPR	CNS - Surveillance
WG-103	Independent Non-Cooperative Surveillance System (INCS)	CNS - Surveillance
WG-104	SWIM Services	SWIM
WG-105	Unmanned Aircraft Systems (UAS)	UAS
WG-106	Electronic Flight Bag (EFB) Software Applications	Miscellaneous
WG-107	DME Infrastructure supporting PBN Positioning	CNS - Navigation
WG-108	ATN/IPS	CNS - Datalink
WG-109	Runway Weather Information Systems	Airports
WG-110	Helicopter Terrain Awareness and Warning Systems (HTAWS)	Avionics - Safety systems
WG-111	Airport Collaborative Decision Making (A-CDM)	Airports
WG-112	Vertical Take Off and Landing (VTOL)	Miscellaneous
WG-113	Hybrid Electric Propulsion	Miscellaneous
WG-114	Artificial Intelligence	Miscellaneous
WG-115	Counter UAS (C-UAS)	UAS
WG-116	High Voltage Systems and Components in Aviation	Miscellaneous
WG-117	Topics on Software Advancement	Miscellaneous
WG-118	Crash-Protected and Lightweight Flight Recorders	Avionics - Safety systems
WG-119	Radar Altimeters	Avionics - Architecture & Network
WG-120	Technical Means for identifying potential Covid-19 carriers among passengers	Miscellaneous
WG-121	Aircraft Cleaning	Miscellaneous
WG-122	Virtual Centre	ATM - Flight Data Processing
FAS	Forum on Aeronautical Software	

WG-14 Environment

CHAIRPERSON: Marc Ponçon, AIRBUS Helicopters
SECRETARY: Gilles Crousier, SAFRAN

Created in September 1970, WG-14 continues to review and update ED-14 environmental conditions and test procedures for airborne equipment including the related user guide material in ED-234 User Guides Supplement to ED-14G.

ED-14 and DO-160 were initially a set of simple procedures and limits that were used to guarantee a minimum qualification level regarding the ability of airborne equipment to function in the on board aircraft environment. Since the creation of WG-14, the purpose has evolved and many sections aim to provide guidance on environmental stress, which is as similar as possible to actual inflight conditions. This process of evolution has resulted in more complex considerations and consequently a need to provide more technical guidance to users.

In order to keep the main requirement section of the documentation limited in volume, it was decided to provide this guidance as appendices gathered in a separated ED-234/DO-357 document, "Supplement to ED-14G User's Guide". This was successfully completed in 2015.

Due to technology evolution, equipment test levels and procedures need to be periodically updated,

so that ED-14/DO-160 is now published as edition G, and although the document has reached a high maturity level, it will continue to evolve on a regular basis. WG-14 collaborates closely with RTCA SC-135 Environmental Testing in the development of these documents to ensure technically identical standards in EUROCAE and RTCA.

In 2018 the ToR of WG-14 were supplemented with a new deliverable - Minimum Standard Environmental Test Conditions (categories) and Applicable Test Procedures for Ground Based Equipment. As technology evolves and Unmanned Aircraft Systems (UAS) are integrated into commercial applications, it is considered necessary to review existing environmental qualification standards and requirements for the surface-based equipment, (stationary ground, mobile ground, and sea-based) and provide the environmental qualification requirements for UAS Detect and Avoid (DAA), the Command and Control Communications (C3) and Control Station Equipment.

WG-14 will work in close collaboration with EUROCAE WG-105 and RTCA's SC-135 and SC-228 to develop a document that specifies ground based environments and the procedures required to test for equipment installed in those environments. The main focus is on specifying the environment conditions. In addition, the environmental test procedures will also be specified.



WG-28 Ground Based Augmentation System (GBAS)

SECRETARY: Linda Lavik, INDRA

WG-28 activities are driven by the objectives of developing standards relating to GBAS ground sub-systems including multi-constellation multi-frequency concepts based on Galileo.

Since its creation in December 1985, WG-28 worked on the maintenance of ED-114 MOPS for Global Navigation Satellite System (GNSS) Ground Based Augmentation System (GBAS) ground equipment to support Category I Operations.

The last revision of ED-114B MOPS for GNSS GBAS ground equipment support for precision approach and landing, was published in September 2019.

An ED-114B change 1 is under development to resolve issues and reflects changes in the Standard And Recommended Practices (SARPs) and RTCA airborne Minimum Operational Performance Standard (MOPS) on the topic of VHF Data Broadcast (VDB). The ED-114B change 1 will also identify dependencies between the ground and airborne elements of GBAS for consideration in equipment approval.

WG-28 is further collaborating with the ICAO Navigation System Panel (NSP) in the context of GBAS Dual Frequency Multi-Constellation (DFMC) developments. The group also continues to monitor the activity within WG-62 and RTCA SC-159 Global Positioning System, who are developing airborne MOPS that will be relevant to GBAS DFMC operation.

WG-31 Lightning

CHAIRPERSON: Franck Flourens, AIRBUS
SECRETARY: Dan Morgan, ELEMENT

Created February 1987, Working Group (WG) 31 is tasked with preparing technical standards, specifications and guidance material for supporting the development of regulation and compliance processes in relation to the hazards of Lightning and Electrostatics. WG 31 works in liaison with the SAE AE2 Lightning Committee.

The mandate of WG-31 has been updated recently to extend the scope to all electromagnetic threats (typically high-intensity radiated field (HIRF)). The key topics today are still fuel tank protection against ignition risks, the test methods for supporting lightning certification, the guidance for demonstrating compliance to HIRF, the lightning test methods for equipment and guidance for the use of simulation in support of compliance processes. The WG is running five Sub Groups (SGs) to deal with these matters in parallel with equivalent SAE AE2 and SAE AE4 Sub Groups.

New members joined the group in 2020 bringing about a stronger focus of expertise for the task group working on simulation. The new members have improved the diversity of the group with a better representation of general aviation, companies working on simulation S/W, airworthiness authorities and research laboratories. The new WG members have also strengthened the group by increasing the number of females represented from 5% to 20%.

The COVID-19 pandemic of 2020 has had significant impact on our activities, making face to face meetings difficult to achieve. However, virtual meetings have been managed efficiently thanks to the willingness and discipline of all involved. One of the benefits of virtual meetings is that they offer more possibilities for overseas members to participate. We hope to resume physical meetings in 2021 but the principle of a virtual meeting once a year could become a permanent feature.

The first achievement in 2019/2020 was the release of the ED-158 which provides guidelines for certifying aircraft to the indirect effects of lightning.

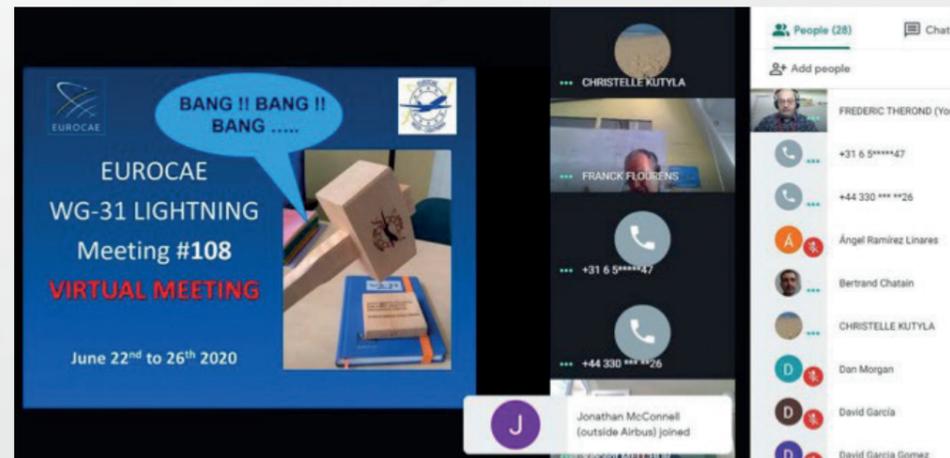
ED-158 is a 255-page document that took 5 years to complete. This document is a cornerstone in the lightning protection compliance process. It provides all the methods required to address the different categories of systems including the following:

- ▶ 1. to delineate the boundaries of a system level verification test,
- ▶ 2. to make the link between A/C characterisation test and functional tests,
- ▶ 3. to frame how to consider similarity,
- ▶ 4. extrapolation from one topology to another,
- ▶ 5. address continuous airworthiness.

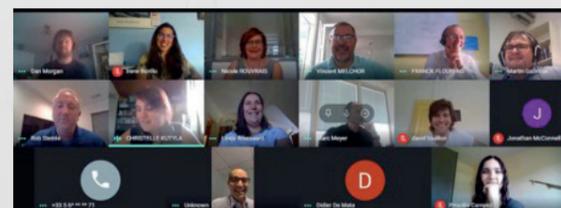
ED-158 is harmonised with the SAE document (ARP5415B).

The committee recognises the key role of Simeon EARL and Frédéric THEROND who took responsibility for this document and ensured a complete convergence of task group and the SAE AE2 views.

Another WG-31 achievement of 2020 was the release of document ER-021. ER-021 is aimed at explaining the mechanism and rationale related to a new test method for assessing the severity of ignition sources. This method is based on the quantification of the light emitted by a spark complemented by a specific image processing. It is a step into new technology as the former method was based on the use of Polaroids! Three European laboratories: LCEO in Madrid, Element in Oxford and DGA-TA in France have been instrumental in developing this methodology. This achievement was made under the efficient and very appreciated leadership of Christelle KUTYLA who lead the activities and the production of the report. No nice picture with all the members of the WG-31 standing together this year! But a snapshot of our virtual meeting for giving you an idea of the way it works!



WG-31 meeting #108 VIRTUAL hosted by Google Meet – June 2020



WG-41 Advanced Surface Movement Guidance & Control System (A-SMGCS)

CHAIRPERSON: Roy Posern, FRAPORT
SECRETARY: Vasileios Stefanioros, EASA

PROGRESS

In 2019, WG-41 concluded revision "D" of ED-87 'Minimum Aviation System Performance Standard (MASPS) for Advanced Surface Movement Guidance and Control Systems (A-SMGCS)'. This document was published in June 2019, complementing the EUROCONTROL Specification for A-SMGCS with technical specifications, requirements and test procedures. It provides a basis for the implementation of the A-SMGCS Services Surveillance, Airport Safety Support and Routing at aerodromes. Thus it supports the achievement of conforming to Pilot Common Projects (PCP) as defined under Regulation (EU) No 716/2014 on the establishment of the PCP supporting the implementation of the European Air Traffic Management (ATM) Master Plan (MP). In the second half of 2019, the group started its work on general interoperability requirements for A-SMGCS and on the technical requirements for the A-SMGCS guidance service. The latter work which will eventually result in the upcoming revision "E" of ED-87 document which is due for publication in early 2021.

In 2019 the working group met four times whereas due to the COVID-19 crisis in 2020 only one face-to-face and four virtual meetings will be held in order to support the development of deliverables.

LIAISON

Since the Working Group (WG) had been actively involved in the development of the EUROCONTROL Specification for A-SMGCS as well as in the documents' update, a continuing collaboration with EUROCONTROL was carried on during the development of ED-87D in order to ensure that operational requirements are properly reflected in ED-87D. This ensures that Pilot Common Project (PCP) requirements are addressed appropriately.

Close collaboration with the European Telecommunications Standards Institute (ETSI) ensured the timely maintenance of the existing Community Specifications (CS) and the creation of new standards in the family of European Standard (EN) 303 213. The coordination with the Single European Sky ATM Research (SESAR) Joint Undertaking (SJU) and European ATM Standards Coordination Group (EASCG) is maintained in order to integrate the outcome of the latest SESAR activities on A-SMGCS and to allow that the SESAR Deployment Roadmap can be supported by WG-41 work.

Due to the fact that A-SMGCS has become more and more integrated into the logical and technical networks, many overlap with the work of other working groups and require close coordination. Examples of some of these overlaps are WG-51 SG-4 'ADS-B and Wide Area Multilateration (WAM) Composite Surveillance', WG-49 'Mode S transponders', WG-100 'Remote and Virtual Towers', WG-102 'Generic Surveillance Safety and Performance Requirements GEN-SUR SPR', WG-111 'Airport-Collaborative Decision Making (A-CDM)' etc.

FUTURE ACTIVITIES

The upcoming activities of the working group will focus on the finalisation of the ED-87 MASPS development with requirements on the A-SMGCS Guidance Service, resulting in the revision "E" in 2021. After that, the provision of a set of documents further describing A-SMGCS interoperability in a technical context with specifications for supporting sensor systems for use in A-SMGCS will be developed.

WG-44 Aeronautical Databases

CHAIRPERSON: Stéphane Dubet, DSNA
SECRETARY: Sasho Neshevski, EUROCONTROL

In 2019, WG-44 remained in active monitoring status to observe the industry feedback on WG-44 family of standards and to collect new requirements for aeronautical data and related applications (e.g. for Data Driven Charting). In practice, web meetings have been organised to gather and discuss proposals and information on potential new work topics.

Within the active monitoring phase, several new threads have been identified for future work as in the summer of 2020: These include clarification around data alteration (e.g. addressing erroneous data from authoritative sources, especially non-cooperative sources), Data Process Assurance Level (DPAL) granularity, addressing Data Driven Charting (DDC) and ensuring alignment with the latest changes in both ICAO PANS-AIM and ARINC 424.

WG-49 Mode S Transponder

CHAIRPERSON: Eric Potier, EUROCONTROL

Reactivated in January 2015, WG-49 is working on a revision of the Mode S Transponder MOPS (ED-73/DO-181 and ED-115) to

- ▶ resolve errors reported by transponder manufacturers
- ▶ resolve misalignment between EUROCAE MOPS and RTCA MOPS
- ▶ reflect the last ICAO amendments
- ▶ define new requirements as necessary to ensure transponders are more robust to RF environment encountered nowadays in Europe,
- ▶ review the data provided through transponder registers to support new applications such as ACAS X or Wake Vortex
- ▶ remove unnecessary functions,
- ▶ and to add functions/data to support new ADS-B 1090 MOPS (ED-102B/DO-260C) including a possible new phase modulation scheme which is developed by WG-51/SG-1.

In addition, the future Transponder MOPS will contain basic requirements necessary to include future collision avoidance functionality (ACAS X) into the transponder.

Finally, WG-49 – via the Combined Surveillance Committee CSC – takes on board requirements from EUROCAE WG-76/RTCA SC-206 (AIS/MET Datalink Services) for the provision of the related information.

Since in parallel work is performed on the respective ADS-B document ED-102/DO-260 (MOPS for 1090 MHz Extended Squitter Automatic Dependant Surveillance – Broadcast (ADS-B) & Traffic Information Services – Broadcast (TIS-B)), a Combined Surveillance Committee (CSC) has been established comprising members of EUROCAE WG-49 and WG-51 as well as RTCA SC-209 and SC-186 to ensure a harmonised development. In addition, close cooperation is maintained with EUROCAE WG-75 (Traffic Alert and Collision Avoidance Systems (TCAS)) and WG-76 (AIS/MET Datalink Services) and their respective RTCA counterparts SC-147 and SC-206.

The target date for the availability of these documents is end of 2020.

WG-51 Automatic Dependent Surveillance-Broadcast (ADS-B)

CHAIRPERSON: Michel Procoudine-Gorsky, THALES
SECRETARY: Jörg Steinleitner, EUROCONTROL

Currently WG-51 is active with three Sub Groups:

- ▶ **SG-1**
develops a revision C of ED-102/DO-260, the MOPS for 1090 MHz Extended Squitter Automatic Dependant Surveillance – Broadcast (ADS-B) & Traffic Information Services – Broadcast (TIS-B). The work of SG-1 is performed together with EUROCAE WG-49 and RTCA SC-186/SC-209. These groups are working together in the Combined Surveillance Committee CSC to ensure harmonised development.
- ▶ **SG-3**
develops SPR documents for ADS-B airborne and ground surveillance applications as well as aircraft system MOPS (and possibly MASPS) material. SG-3 has recently published the following documents:
 - ED-194B / DO-317C “MOPS for Aircraft Surveillance Application (ASA) System”

- ED-195B / DO-328B “SPR for Airborne Spacing Flight-deck Interval Management (ASPA-FIM)”
- ED-236A / DO-361A “MOPS for Flight-deck Interval Management (FIM)”

On 10 April 2019 SG-3 also published Change 1 to ED-194A/DO-317B addressing errors found in the Traffic Situation Awareness with Alerting (TSAA) application test vectors. SG-3 works jointly with RTCA SC-186/WG-4.

▶ **SG-4**
is responsible for an update of the “Technical Specification for an ADS-B Ground System” (ED-129C) and an updated “Technical Specification for a Wide Area Multilateration System with Composite Surveillance Functionality” (ED-142A). The latter document will contain requirements for the development of a ground infrastructure that utilises functionalities of both, Multilateration and ADS-B.

SG-2 is currently dormant.

WG-59 Flight Data Processing (FDP) Interoperability

CHAIRPERSON: Philippe Leplae, EUROCONTROL
SECRETARY: Frederic Picard, THALES

WG-59 is tasked with a revision of ED-133 Flight Object Interoperability Specification. This deliverable is supporting the Pilot Common Project PCP.

In order to develop operational and technical requirements as a basis for the revision of ED-133, two Task Forces were established within the remit of the SESAR Joint Undertaking (SJU). These two Task Forces (TF) have been working on that task between 2016 and 2020.

The development of ED-133A follows the extensive validation work performed by the SJU. It is expected that the document will be published by June 2021.

WG-62 GALILEO

CHAIRPERSON: Pierre Bouniol, THALES GROUP
SECRETARY: Pierre Durel, GSA (until May 20)
 Mikael Mabilleanu, GSA (from May 20)

The European Commission has confirmed the full operational capability of Galileo in 2020, and now the contract for the next generation of European Geostationary Navigation Overlay Service (EGNOS), which will augment dual frequency Global Positioning System (GPS) and Galileo, has been awarded. In this context, the work of EUROCAE WG-62 is focused on the development of the Satellite-Based Augmentation System (SBAS) Dual Frequency Multi Constellation (DFMC) receiver Minimum Operational Performance Standard (MOPS) and a first version of the document ED-259. MOPS for Galileo - Global Positioning System - SBAS airborne equipment was published in February 2019. This document is a very important part of the regulatory framework, leading to the certification of equipment.

The objective of WG-62 is now to provide an updated version of the SBAS DFMC receiver MOPS for 2021, in cooperation with RTCA. The attendance of the WG meetings has grown to include most of the stakeholders for such MOPS. Regular virtual conferences, including RTCA attendance, are held between meetings to move forward on the content of the document.

The WG-62 meeting agenda now includes time specifically allocated for the SBAS DFMC MOPS review, and the number of meetings in 2020 has increased to four, including two joined with RTCA (SC-159 SG-2).

WG-63 Complex Aircraft Systems

CHAIRPERSON: Christopher Lacey, AIRBUS
CO-CHAIRPERSON / SECRETARY: Julien Chaou, LIEBHERR AEROSPACE

WG-63 has concentrated most of its resources on the development on ED-268 Development Assurance Objectives for Aerospace Vehicles and Systems, jointly with SAE S-18. The purpose of this document is to provide a minimum set of development assurance objectives to ensure safety for aircraft and system development. The draft document was submitted to the EUROCAE Open Consultation in fall 2019; several important comments were raised and the WG is now in the process of refocussing this deliverable.

In addition, the work on

- ▶ **ED-79B:** Guidelines for Development of Civil Aircraft and Systems
- ▶ **ED-135:** Guidelines and methods for conducting the safety assessment process on civil airborne systems and equipment

WG-63, jointly with SAE S-18, initiated work on a EUROCAE Report, evaluating the applicability of existing development assurance and system safety practices to UAS and VTOL. This task is related to ED-79B and ED-135. It may produce results that could be included in future updates of those guidelines.

To perform this task, WG-63 will also coordinate with WG-105 SG-41 and WG-112 that are respectively producing guidelines on UAS FHA and VTOL safety assessment (CMA, Specific Risks...).

WG-67 Voice over Internet Protocol (VoIP) for ATM

CHAIRPERSON: Liviu Popescu, EUROCONTROL
SECRETARY: Roberto Weger, SITI

WG-67 has published three deliverables:

- ▶ **ED-136B** - Voice over Internet Protocol (VOIP) Air Traffic Management (ATM) System Operational and Technical Requirements
- ▶ **ED-137C** - Interoperability Standard for VOIP ATM Components (published in 4 volumes)
- ▶ **ED-138B** - Network Requirements and Performance for VoIP ATM Systems (published in 2 parts).

Initial implementations of the standards lead to Change Requests (CR) that were collected by the WG-67 leadership. These CRs were processed by WG-67 after it had been reactivated in February 2016. They applied in particular to ED-137, whereas ED-136B and ED-138B remained untouched.

ED-137C consists of four Volumes:

- ▶ **Volume 1.** Radio
- ▶ **Volume 2.** Telephony
- ▶ **Volume 4.** Recording
- ▶ **Volume 5.** Supervision

Volume 3 will no longer be maintained, the requirements were integrated into the other Volumes.

While ED-137C Volume 1 was already approved by the EUROCAE Council in April 2017, Volumes 2 (including 8 Addenda containing requirements for specific functions), 4 and 5 of ED-137C were approved and published in March 2019.

Initiated by the FAA, an "ED-137 Interoperability Event" was organised between 29 April and 10 May 2019. During this event manufacturers of Radios, Voice Communication Systems and

Recording Systems could validate that their ED-137C compliant systems were interoperable with each other. 16 manufacturers attended the event, 81 testing sessions with 2 or 3 participants were organised. This event provided not only a possibility for the manufacturers to validate their systems, but it was also a good opportunity for EUROCAE to ensure that ED-137C is actually "fit for purpose". The results were very convincing with 99,7% of all tests executed being successful.

This large scale validation event resulted in a number of observations that were taken by WG-67 to develop Change documents to Volumes 1, 2 and 4 of ED-137C. These Change documents were published in May 2020.

After leading WG-67 for 16 years, Guy Potiron retired from DSNA at the end of September 2020. Consequently he also stepped down as Chair of WG-67. As his successor Liviu Popescu (EUROCONTROL) will take over the position as WG-67 Chair. He will be supported by Roberto Weger who volunteered (and was elected) for the Secretary position.



WG-72 Aeronautical Systems Security

CHAIRPERSON: Cyrille Rosay, EASA
SECRETARY: Clive Goodchild, BAE SYSTEMS

Created in December 2005, WG-72 was tasked to establish process specifications, guidelines and means of compliance to address security concerns for aeronautical systems. This includes the whole lifecycle of the aeronautical systems, with a view to ensuring safe, secure and efficient operations amid the growing use of highly integrated electronic systems and network technologies on-board aircraft.



Existing and therefore published EUROCAE cyber security standards are regularly referenced.

WG-72 is composed of three sub-groups whose activities are partially joined with RTCA-216. WG-72 is currently developing several new standards addressing different aspects of cyber security. From earlier standards focussing on aircraft security, the range of topics is shifting toward the consideration of other domains of civil aviation. This is illustrated by the last standard published by WG-72 SG-2 ED-205, focusing on ATM. The number of WG-72 participants is increasing and the group is looking for contributions from new types of stakeholder such as airlines and airports.

WG-72 SG-2 has published ED-205, addressing security for the ATM/ANS ground system in March 2019. A revision A is currently under development:

► **ED-205A Process Standard for Security certification and declaration of ATM/ANS ground systems.**

This revision will address comments received, and development in the regulatory framework. WG-72 SG-3 is tasked to work on both ED-204A / DO-355A and on ED-xxx on Security Event Management. These are joint activities with RTCA SC-216.

► **ED-204A/DO-355A Information Security Guidance for Continuing Airworthiness,** was published in September 2020.

The guidance for continuing airworthiness is updated based on outcomes of the Aircraft Systems Information Security/Protection Aviation

Rulemaking Advisory Committee (ASISSP ARAC) and ED-203A update..

► **ED-xxx Guidance on Security Event Management**

This new document will provide guidance on security event management for various actors in the aviation environment, helping to develop processes and procedures for identifying and reporting security events and developing appropriate responses with respect to continuing airworthiness.

WG-72 SG-4 has been tasked with revisiting ED-201.

► **ED-201A AISS Framework Guidance Document**

ED-201 provides the framework for linking the various portions of security in aviation together. As the relevant standards are being updated and new ones generated, ED-201 needs to be updated to capture these changes. In addition, EASA is in the process of generating a set of regulations ("horizontal rule") across all aviation domains to introduce an Information Security Management System and shared risk across organisations.

In addition to its own activities, WG-72 is also a pool of expertise in support of the activities of other working groups. For example, WG-72 is supporting the activities of WG-98 SG-1 on Aircraft Emergency Locator Return Link Services. WG-72 leadership is also in contact with WG-82 New Air-Ground Data Link Technologies, WG-105 on Unmanned Aircraft Systems and WG-114 on Artificial intelligence.

WG-72 structure:



WG-75 Traffic Collision Avoidance System (TCAS)

CHAIRPERSON: Bill Booth, EUROCONTROL
SECRETARY: Garfield Dean, EUROCONTROL

After publication of ED-256/DO-385 (MOPS for Airborne Collision Avoidance System X (ACAS X) (ACAS Xa AND ACAS Xo)) in October 2018, WG-75, which works jointly with RTCA SC-147, continued in the development of additional documents standardising the suite of ACAS systems.

Focus was put on the development of the "MOPS for ACAS Xu", the ACAS variant for Unmanned Aircraft Systems. As ED-275 the document was submitted for Open Consultation between 14 May 2020 and 27 April 2020. Following the successful completion of the comment resolution process, Council Approval and subsequent publication is expected for December 2020.

As in the future different types of collision avoidance systems will simultaneously fly in the airspace, interoperability between these systems is paramount. WG-75 and SC-147 developed a "MASPS for the Interoperability of Collision Avoidance Systems" which was published as ED-264 in September 2020.

SC-147 has now launched the development of a "MOPS for ACAS sXu", a document geared towards the requirements of small Unmanned aircraft. While this activity will be continued jointly, the lead will be with EUROCAE WG-105 because of their specialisation on Unmanned Systems. WG-75, however, will support the development with their expertise in collision avoidance systems.

WG-76 AIS/MET Datalink Applications

CHAIRPERSON: Vacant
SECRETARY: Macarena Martin Viton, AIRBUS

In their report WG-76 has identified 17 services in the AIS/MET Datalink Domain to be further defined in detail. This work is currently ongoing.

In order to achieve globally harmonised implementation of the AIS/MET Datalink Services, the development of these service specification is performed in a joint activity of WG-76 and RTCA SC-206.

Since in the meantime, RTCA SC-206 has published DO-364, a MASPS containing three example services for the requirements determination, it is planned to add the commonly developed service specifications to this MASPS to publish a complete document.

SWIM compliance is one of the requirements on the services specified by WG-76/SC-206, which is why close cooperation will be established with the SWIM experts of EUROCAE WG-104.

WG-79 Enhanced Vision Systems (EVS) / Synthetic Vision Systems (SVS)

CHAIRPERSON: Carlo Tiana, COLLINS AEROSPACE
SECRETARY: Trish Ververs, HONEYWELL

EUROCAE WG-79 continues to meet and produce regulatory support documents for Enhanced Vision Systems in airborne platforms.

Following publication of ED-255, which was aimed at situational awareness operational benefits, for a Combined Vision System (CVS) for Helicopter Operations, the group has been developing an extension of this document to define vision systems operational credit, with initial focus on MASPS

for Offshore Helicopter Low Visibility Operations. Development of this document has been slowed by the challenging conditions created by current events, and the Terms of Reference (ToR) are being modified to extend the expected completion date.

Additional coordination for the work of this group has also taken place with FAA, EASA and certain other related SAE Working Groups. WG-79 continues to work on harmonising Low-Visibility Take-Off (LVTO), and Synthetic-Vision related documents generated in collaboration with RTCA SC-213.



WG-80 Hydrogen Fuel Cell Systems

CHAIRPERSON: Olivier Savin, DASSAULT AVIATION
SECRETARY: Carlos Mourao, EMBRAER

WG-80 was established in 2008 and is tasked with developing operational guidelines, best practice and standards to support the certification of hydrogen fuel cells in aircraft. These activities are being undertaken in coordination with SAE AE-7.

As an initial deliverable, the committee developed a standard on aircraft fuel cell safety guidelines, ED-219/AIR6464, which was published in early 2013. In 2017, ED-245/AS6858, a Minimum Aviation Systems Performance Standard (MASPS) for the installation of fuel cell systems on large civil aircraft, was developed and published.

In December 2019, ER-020/AIR7765, Considerations for hydrogen fuel cells in airborne applications, was published.

The WG is currently working on MASPS for Liquid Hydrogen fuel cells on-board aircraft. This MASPS should define technical guidelines for the safe development, testing, integration, validation and certification of Liquid Hydrogen including fuel storage and fuel distribution.

Hydrogen fuel is a promising and environmentally friendly alternative to fossil fuels and should help the aviation industry/community reach emissions reduction targets by 2050, namely 75% CO2 and 90% NOx emissions reductions, relative to the year 2000.

WG-81 Interoperability of ATM Simulators

CHAIRPERSON: Thomas Damm, DFS
SECRETARIES: Jose Manuel Cordero, ENAIRE

Created March 2008, the group is currently working on Revision B of ED-147A "ATM Validation Platforms interoperability requirement specification" in order to maintain the Reference Information Model and to introduce the Model Driven Approach (MDA).

Publication for the new version is planned for Q1/2021.

ED-147 implementations have been a key enabler for cross ATM-Domain validation exercises in SESAR.

Due to their capabilities of connecting the various existing Industry Based pre-operational ATM Validation Platforms (IBP), new operational concepts could be validated and their implementations in industry prototypes could be verified.

In order to support the use of ED-147B, ED-148 "Guidance to achieve ATM Validation Platforms interoperability", will be updated to be published as well in Q1/2021. Scheduled for Q1/2022 the group will provide a Supplement to ED-147B to describe the "Technology Mapping for the High Level Architecture (HLA)".

WG-82 New Air-Ground Data Link Technologies

CHAIRPERSON: Armin Schlereth, DFS
SECRETARY: Martina Angelone, ESA

WG-82 is tasked to develop standards relative to new air-ground data link technologies involving: airport surface, satellite, and enroute/Terminal Area TMA L-band systems. The documents under development are intended to be used in the context of ICAO Standards and Recommended Practices (SARPs) development or as a Means of Compliance (MoC).

In March 2020, WG-82 published:

- ▶ ED-242B: Minimum Aviation System Performance Standard (MASPS) for Aeronautical Mobile Satellite Radiocommunication Services AMS(R)S Data and Voice Communications Supporting Required Communications Performance (RCP) and Required Surveillance Performance (RSP)

- ▶ ED-243B: Minimum Operational Performance Standards (MOPS) for Avionics Supporting Next Generation Satellite Systems (NGSS)

Following the finalisation of the two revision Bs, WG-82 is now tasked with the following updates for the two standards. Both are planned to be published by the end of 2021.

- ▶ The MASPS ED-242C will be expanded with an update of Appendix B to reflect new frequency and power plan for Air Traffic Control tower (ATCt).

- ▶ The MOPS ED-243C will be expanded with an update of terminal specification for SwiftBroadband (SBB) terminals for Long-Term Evolution (LTE) and ATCt blocking immunity.

WG-82 works in coordination with RTCA SC-223 Aeronautical Mobile Airport Communication System (AEROMACS) and with RTCA-222 on AMS(R)S.

WG-83 Foreign Object debris Detection (FOD)

CHAIRPERSON: Stephane Larose, THALES LAS
SECRETARY: Catherine Bonari, DGAC STAC

Created in 2010, WG-83 developed ED-235 Minimum Aviation System Performance Standard (MASPS) for automatic foreign Object Debris Detection Systems, published in 2016.

In August 2020, WG-83 published its second document ED-274 Operational Services and Environment Definition (OSED), which provides guidance related to the operation of an automatic FOD detection system on an aerodrome movement area. ED-274 contains requirements to be addressed in the preparatory phase, in order to facilitate an FOD detection system deployment and subsequent operation. It also outlines the operational needs for the activities and actions that are to be carried out by the persons that are involved in the day-to-day operation of the system.

From a safety perspective, ED-274 details the requirements necessary for the protection of an FOD detection system within the aerodrome environment, in order to ensure that the system maintains its availability and functionality. In addition, it addresses the training that needs to be created and delivered as part of a system's implementation and use within the aerodrome FOD management program. The training should be provided to both the frontline operators and other stakeholders. As a final step, ED-274 outlines the requirements related to the assessment of the system in terms of its compliance and its outputs, with a view to continually improve its effectiveness and performance throughout its use.

As a next step, WG-83 will meet to discuss on its future work programme taking into consideration the latest technological developments related to FOD and potential updates to ED-235 published in 2016.

WG-85 4D Navigation

CHAIRPERSON: Okuary Osechas, DLR
SECRETARY: Ricardo de Sousa, NATS

Working Group 85 (4D Navigation) completed ED-75D "Minimum Aviation System Performance Standards (MASPS): Required Navigation Performance (RNP) for Area Navigation" which was published in October 2014 as a joint document with RTCA Special Committee SC-227 (the equivalent RTCA reference is DO-236C plus Change 1). Since then WG-85 has been "dormant".

On 9 June 2020, the EUROCAE Council approved the reactivation of WG-85 "4D Navigation".

In line with the Terms of Reference, the group shall – in a joint effort with RTCA SC-227 – revise ED-75/DO-236 to "ensure more robust support for implementation of Performance Based Navigation (PBN) operations relying on the RNP system by offering new minimum performance standards to provide resilient RNP capability through Distance Measuring Equipment (DME) navigation.

The committee will also address PBN lessons learned as applicable to the material in the RNP MASPS and Minimum Operational Performance Standard (MOPS) and offer ancillary improvements to the standards".

During this revision, WG-85 will ensure operational compatibility between ED-75/DO-236 and the functionalities described in ED-194/DO-317, the MOPS for Airborne Surveillance Applications (ASA) Systems, as well as ED-236/DO-361, the MOPS for Flight-deck Interval Management (FIM). This will better facilitate the RNP system's support for future aircraft.

The work on ED-75/DO-236 is complimentary to the current activities of Working Group 107 with the WG-107 MASPS focusing on infrastructure requirements as a complement to the aircraft-focused ED-75/DO-236. WG-85 will coordinate with SC-227 to support WG-107 regarding assumptions about aircraft behaviour when navigating using DME as an area navigation sensor. WG-107 will support the joint WG-85 / SC-227 concerning assumptions about DME infrastructure performance.

Publication of ED-75E/DO-236D is scheduled for Q2/2022.

WG-88 On-board Weight & Balance Systems (OBWBS)

WG-88 has been dormant during this reporting period.

WG-92 VDL Mode 2

CHAIRPERSON: Stéphane Pelleschi,
COLLINS AEROSPACE

WG-92 is working jointly with RTCA SC-214 VDL Sub Group and in close coordination with the AEEC Datalink Committee.

In 2020, the joint WG achieved the publication of ED-276/DO-383, Guidance on Air to Ground VDL Mode 2 Interoperability. In the VDL Mode 2 environment, where the protocol and infrastructure is a real challenge in terms of interoperability, it is important to provide guidance and recommendations about how the ground systems are expected to behave and what is the expected avionics answer.

This document aims at defining a coordinated understanding of the ground behaviours and the Minimum Operational Performance Standard (MOPS), which are more related to avionics systems. In particular some out of sync cases have been identified in operations, showing a need for interoperability improvement.

In addition, the group submitted a comprehensive analysis of the future VDL Mode 2 standardisation needs to the TAC and on that basis initiated the revision of ED-92D, MOPS for an Airborne VDL Mode 2 System Operating in the Frequency Range 118-136.975 MHz to support ATN/IPS operations.

WG-95 Inflight Ice Detection

WG-95 has been dormant during this reporting period.

WG-96 Wireless On-Board Avionics Networks (WOBAN)

CHAIRPERSON: Robin Davies, BAE SYSTEMS
SECRETARY: Radek Zakrzewski, AIRBUS

The Chair of WG-96 and active TAC member, Robin Davies sadly and unexpectedly passed away this year. The EUROCAE community expresses its deepest sympathy and condolences to Robin's family.

WG-96 was established in 2013 to produce guidance material for the certification of Wireless On-Board Avionics Networks (WOBAN). This work was completed in 2017. WG-96 has since started a joint activity with RTCA SC-236 to develop standards for Wireless Avionics Intra-Communications (WAIC) systems.

The Radio Regulations were changed in 2015 to allow WAIC systems to share the band 4200 - 4400 MHz with Radio Altimeters. WAIC systems must be able to share the band with Radio Altimeters and WAIC systems on other aircraft in a way that (a) ensures the safe operation of Radio Altimeters is not

compromised and (b) the worst-case performance of a WAIC system can be predetermined; these two aspects are major prerequisites for proof of airworthiness for future WAIC systems.

Two documents are under development : Minimum Aviation System Performance Standard (MASPS), ED-260A, currently under comment resolution following the closure of the Open Consultation (OC) in March 2020, and a Minimum Operational Performance Standard (MOPS), expected to be published in October 2021.

- ▶ ED-260A: MASPS for Coexistence of Wireless Avionics Intra-Communication Systems within 4200-4400 MHz
- ▶ ED-xxx: MOPS for a Wireless Avionics Intra-Communication System



WG-97 Interoperability of virtual avionic components

CHAIRPERSON: Olivier Fourcade, AIRBUS
SECRETARY: Virginie Frouté, DASSAULT AVIATION

Physical test-benches used in aircraft development are complex platforms with high initial and recurrent costs. They are generally critical to the development and construction of aircraft components and systems and cannot be easily moved or replicated in order to increase the available validation capacity.

One means to alleviate these problems is to use virtual and hybrid testing. Virtual and hybrid testing, is a promising solution that has already demonstrated its benefits in other industries. However, in the avionics industry, it brings specific challenges: complex distributed systems, hardware heterogeneity, and multiple supplier infrastructures.

Guidance material that can become an internationally recognised standard is necessary:

▶ The guidance material/standards will need to provide a framework that supports the demonstra-

tion of the interoperability of virtual avionic components.

▶ The guidance material/standards will also need to outline a global process that describes the exchange, the integration and exploitation of virtual equipment within virtual or hybrid test benches.

Working Group (WG)-97 was established in 2015 and tasked with developing standards supporting the objectives outlined in the previous paragraph. ED-247, now in revision A, was finalised in April 2020. ED-247 is the official standard for virtual interoperable simulation and hybrid testing of aircraft systems.

WG-97 includes representatives of the key aviation industry: aviation authorities, aircraft manufacturers, multi systems providers, test benches solution provider and training organisations.

The group is planning to develop and release a revision B of ED-247 in April 2021. Revision B will extend the technical perimeters of the standard in order to increase the standard of result needed to achieve certification of systems.

WG-98 Aircraft Emergency Locator Transmitters

CHAIRPERSON: Philippe Plantin de Hugues, BUREAU D'ENQUETES ET D'ANALYSES
SG-1 CHAIRPERSONS: Alain Bouhet, OROLIA; Christophe Chatain, ECA
SG-1 SECRETARIES: Carmen Aguilera, GSA; Manuel Lopez-Martinez, GSA

Created in July 2013, WG-98 is tasked with improving performance standards for Emergency Locator Transmitters (ELTs). In recent years several aircraft disappearances have occurred over water, including Malaysian MH370. In a number of those occurrences, it was not possible to recover Persons On Board (POB), major portions of wreckage or flight recorders. These short comings were a direct

result of not knowing the location of the downed aircraft. WG-98 intends to propose strong standards for the carriage and operation of ELTs with a view to improving the emergency response time and activities associated with post accident recovery processes.

WG-98, jointly with RTCA SC-229 has published in June 2020:

▶ **ED-62B Change 1** – Minimum Operation Performance Standard (MOPS) for Aircraft Emergency Locator Transmitters 406 MHz

Most activities are now taking place in WG-98 SG-1 ELT Return Link Service (RLS). The focus of this SG

is to address ELT activation from the ground. The associated Minimum Aviation System Performance Standard (MASPS) developed is expected to be published toward the end of 2020.

▶ **ED-277:** Minimum Aviation Systems Performance Standards for Aircraft Emergency Locator Transmitter Remote Command via Return Link Service

These standards cover the function of triggering ELT transmissions from the ground. The standards will define high-level concepts and typical functional interface requirements, including for the satellite segment. The use of new generation ELTs triggered from the ground through RLS will solve the issue of localisation of non-cooperative aircraft and of General Aviation aircraft that have crashed with no ELT activation.

WG-98 SG-1 is maintaining close liaison with RTCA, the ICAO Joint Working Group of harmonisation of aeronautical and maritime Search And Rescue (JWG-SAR) and COSPAS-SARSAT. North American and European stakeholders are involved in the activity.



WG-100 Remote and Virtual Tower

CHAIRPERSON: Joern Jakobi, DLR
SECRETARY: Mariann Hintz, EUROCONTROL

Working Group 100, "Remote and Virtual Tower", was launched in June 2014. In September 2016 the first Minimum Aviation System Performance Standard "MASPS" for "Remote Tower Optical Systems" ED-240 was released and in October 2018 the updated standard ED-240A was published. These MASPS are applicable to all optical sensor configurations (visible, as well as infrared spectrum) to be used for the implementation of the remote provision of Air Traffic Service (ATS) to an aerodrome, encompassing the whole chain from sensor to display. In addition, ED-240A addresses performance specifications regarding optional

technologies like 'visual tracking' and 'Pan/Tilt/Zoom (PTZ) object following'.

Currently, based on feedback received from the user community on ED-240A, WG-100 is focusing on a major revision of ED-240A, which will result in ED-240A change 1 release by Q4/2021. The new release will receive a refurbishment in terms of generally improved user-friendliness and readability, a better explanation of developing and measuring of the Detection and Recognition Range Performance (DRRP) requirements, more consistent verification and validation procedures, adding material on how to use the document addressing the different stakeholders, and augmenting the material to give additional guidance and incorporate the latest developments and experience of the working group members as they are involved in new Remote Tower installations in Europe, North American and Asia.



The last time the group had a face-to-face workshop was in Fort Collins/Colorado in January 2020 hosted by FAA and LifeCycleProductions.

The group was welcomed by Wade Troxell, Mayor of Fort Collins, Bill Payne on behalf of the State of Colorado and Chris Rocheleau, Executive Director International Affairs FAA. The group was also given the chance to see the Remote Tower installation at the Northern Colorado Regional Airport (FNL/KFNL).

Demonstration of the FREQUENTIS Remote Tower Solution, Vienna



Since then the group has met in bi-weekly WebEx meetings to guarantee a minimum exchange between of the group members, and also to allow progress with ED-240A Change 1 in order to meet the updated target date.

As soon as ED-240 Change 1 is finalised, WG-100 will focus on an extension of the current MASPS (revision B) to cover processing and integration of information produced by existing or emerging

surveillance systems/sensors, such as Primary Surveillance Radar (PSR), Secondary Surveillance Radar (SSR), Surface Movement Radar (SMR), Wide Area Multilateration/Airport Surface Multilateration (WAM/MLAT), Automatic Dependent Surveillance Broadcast (ADS-B), and/or other sensors.

WG-101 Runway Overrun Awareness and Alerting System (ROAAS)

WG-101 has been dormant since the publication of ED-250 Minimum Operational Performance Standard (MOPS) for a Runway Overrun Awareness and Alerting System in December 2017.

In 2018, EASA published NPA 2018-12, making reference to the ED as acceptable means of compliance, which resulted in the formal publication of ETSO-2C518 in July 2020.

WG-102 GEN-SUR SPR

CHAIRPERSON: Roland Mallwitz, DFS
SECRETARY: Jörg Steinleitner, EUROCONTROL

WG-102 is tasked to specify generic surveillance safety and performance requirements. These are based on operationally driven ATC surveillance requirements that are levied onto a logical end-to-end ATC surveillance function and its respective sub-functions (resembling typical physical ATC surveillance components).

The document, which will be published as ED-261, consists of three Volumes:

Volume 1 captures the minimum safety and performance requirements, to be met by a ground surveillance system in support of the air traffic service in a given airspace environment;

Volume 2 contains the determination of the GEN-SUR safety and performance objectives, from which the Volume 1 requirements are derived.

Volume 3 provides for a generic framework that may be used at local level in support of the demonstration that the implementation of the local ground surveillance system, in compliance with this GEN-SUR SPR, is acceptably safe.

ED-261 was submitted for Open Consultation between 16 January 2020 and 03 April 2020. Due to the COVID-19 crisis organising a face-to-face meeting for comment resolution was not possible and the comment resolution was performed as virtual meeting between 5 to 9 October 2020. Comment resolution is still ongoing, the intention is to go for Council Approval and publication still in 2020.

WG-103 Independent Non-Cooperative Surveillance (INCS) System

CHAIRPERSON: Tim Quilter, AVEILLANT
SECRETARY: Hannes Stahl, HENSOLDT

WG-103 is tasked to develop a Technical Standard for an INCS System.

It was established in recognition that the design of non-cooperative sensors is undergoing a renaissance and that the sensors that traditionally fulfilled this need, rotating Primary Surveillance Radars, are now being supplemented by a host of new designs made possible through the technical advances that have occurred in recent years. Whilst technologies have moved on, the operational requirements have similarly adapted to meet evolving environments. Mitigating the clutter originating from wind farms and detecting small

Remotely Piloted Aircraft are typical of the new demands being placed upon new sensor designs.

The lack of a common technical specification, upon which to base the designs of the emerging sensors, threatened to lead to a plethora of sensor types with the potential risk that none met the operational needs of the end user. The group has already made significant progress on assembling a balanced specification that is agnostic enough so as not to unnecessarily constrain the designs, and yet precise enough to ensure the systems produced in accordance with it are both interoperable and capable of meeting the user requirements. The group comprises a diverse mix of sensor manufacturers and ANSPs. Whilst the participation is largely European there are also representations from America and the Far East.

WG-104 System Wide Information Management (SWIM)

CHAIRPERSON: Oliver Krüger, DFS
SECRETARY: Eric Roelants, EUROCONTROL

EUROCAE has produced a number of deliverables in the SWIM area, including but not limited to a SWIM Service specification on an information service for the Arrival Manager (AMAN) extended horizon, a template for future service standardisation within EUROCAE and a list of potential SWIM Services to be standardised.

The role of EUROCAE WG-104 is to provide EUROCAE working groups with even more reliable and useful support material in form of an improved template and a comprehensive methodology to accomplish their SWIM Service standardisation activities. It is envisaged that the outcome produced will be immediately useable in the European SWIM context.

In line with the current Terms of Reference, WG-104 is currently working on the following deliverables:

SWIM Service Service-Standardisation Template and Method

The focus of the task will be to work on the template and methods, so that working groups which are about to standardise SWIM Services can make the best use of it. To improve the ER-018 template, it was identified that existing service design standards like the Open Geospatial Consortium (OGC) Web Service specifications should find their way into EUROCAE standardisation in order to facilitate the usage of those existing standards and providing means to working groups to decide, whether such standards are appropriate to be used for their specific SWIM service standardisation activity.

Final Report of WG-104

The final report will give account on the activities undertaken by the working group. It will provide i. a.:

- ▶ Lessons learned
- ▶ Information on reached objective
- ▶ Information on not-reached objectives (with justifications)
- ▶ History of activities

WG-105 Unmanned Aircraft Systems (UAS)

CHAIRPERSON: Christian Cantaloube, THALES

In 2020, WG-105 completes its fourth year of activity after its first meeting in November 2016. WG-105 was created by merging previous Working Groups (WG)-73 and WG-93.

According to its Terms of Reference (ToR), WG-105 is to develop standards to facilitate the safe integration of all types of UAS into all types of airspace under all conditions and for all operations.

Considering the broad scope and the extent of UAS issues, a multi-layer structure was created by the WG-105 leadership and in order to implement the work programme efficiently has been adjusted in 2020 in agreement with EUROCAE Secretariat and the Technical Advisory Committee (TAC). WG-105 (which today counts more than 270 registered members from more than 110 organisations) is organised around six SGs covering the different topics to be covered in the development of relevant UAS standards:

- ▶ **SG-1:** Detect and Avoid (DAA)
- ▶ **SG-2:** Command, Control, Communications and Security (C3S)
- ▶ **SG-3:** UAS Traffic Management (UTM)
- ▶ **SG-4:** Design and Airworthiness (D&Aw)
- ▶ **SG-5:** Enhanced RPAS Automation (ERA)
- ▶ **SG-6:** Specific Operations Risk Assessment (SORA)

Management and coordination of the functions of the six SGs is undertaken by the WG-105 Steering Committee, comprised of the Chairpersons, the Secretary, the TPM, the TSE, the SG leaders and invited stakeholder representatives.

Due account is taken of the emerging UAS regulations centred around the proportionate risk approach and coordination is constantly pursued with authorities (EASA, FAA, JARUS, ICAO), other stakeholders and standards organisations where appropriate. Coordination is also ensured through the European UAS Standards Coordination Group (EUSCG), created under the initiative of the European Commission and EASA and led by EUROCAE Secretariat.

Keeping its deliverable-oriented approach, the following have been produced in the last year, after due WG review & Open Consultation (OC).

DAA

- ED-267: Operational Services and Environment Definition (OSED) DAA in Very Low Level (VLL)
- ED-271: Minimum Aviation System Performance Standard (MASPS) for Remotely Piloted Aircraft Systems (RPAS) DAA in Instrument Flight Rules (IFR) in Airspace A to C (OC closed, Publication expected by end 2020)

C3S

- ED-266: Guidance on Spectrum for UAS C2 link



UTM

- ED-269: Geofencing Minimum Operational Performance Standard (MOPS)
- ED-270: Geocaging MOPS
- ED-282: E-Identification (OC closed, Publication expected before end 2020)
- Workplan update proposal (for a 2nd batch of activities to be launched in 2021 to support U-Space development)

Design & Airworthiness

- ED-272: MASPS for Remote Pilot Station (RPS) of RPAS in IFR in airspace A to C
- ED-279: Generic RPAS Functional Hazard Analysis (FHA) guidance

ERA

- ED-281: MASPS Automation & Emergency Recovery

- ED-283: MASPS Automatic Take-off and landing (OC closed, Publication expected before end 2020)
- ED-284: MASPS Auto Taxi (OC closed, Publication expected before end 2020)

SORA

- ED-280: Guidance for safety assessment (OSO 5) for low and medium robustness (OC closed, Publication expected before end 2020)
- Workplan update (for a 2nd batch of activities now agreed and to be launched before end 2020)

About 10 deliverables remain to be worked out and delivered within the currently agreed work programme. The WG-105 work Programme is regularly updated to take into account the needs of the UAS eco-system.

WG-106 Electronic Flight Bag (EFB) Software Applications

CHAIRPERSON: Eric Lesage, AIRBUS OPERATIONS
SECRETARY: Manuel Gucemas, THALES GROUP

WG-106 has been tasked to develop a new Minimum Operational Performance Standard (MOPS) for EFB software application. This MOPS applicable to EFB application suppliers is initially intended to support the approval of EFB applications by the European Union Aviation Safety Agency (EASA).

After a last plenary meeting in July 2019, the end of 2019 was focused on the finalisation of the MOPS for the Open Consultation. The EFB User Forum in November was an opportunity for the Chairperson and the Secretary to give an update on the standard and the imminent consultation phase to the EFB community. The draft ED-273 was issued for Consultation in December 2019. 519 comments (including 33 "non-concur") collected from 14 organisations confirmed the interest of stakeholders for the standard.

Due to COVID-19 restrictions, the comment resolution proposals were prepared remotely in sub-groups and the resolution proposals were validated in formal plenary virtual meetings. While the COVID crisis slowed down the resolution work, a physical meeting remains planned to solve the last outstanding comments that cannot be addressed during the remote meetings.



WG-107 DME Infrastructure supporting PBN Positioning

CHAIRPERSON: Gerhard Berz, EUROCONTROL
SECRETARY: Maurizio Scaramuzza, SKYGUIDE

The 12th ICAO Air Navigation Conference (ANC) recognised the continued need for terrestrial-based reversion capabilities to guard against the risks associated with Global Navigation Satellite System (GNSS) outages. Currently Global Positioning System (GPS) is the enabling infrastructure for all Performance Based Navigation (PBN) applications, both Area Navigation (RNAV) and Performance Based Navigation (RNP). Generally speaking, the use of Distance Measuring Equipment (DME) is considered to only support RNAV applications. This leads to the perception that in case of loss of RNP capabilities based on GPS, reversion to a lower performing navigation capability and associated mitigation measures become necessary.

An analysis conducted by EUROCONTROL, Airbus and other partners (SESAR 15.3.2 D12) has concluded that RNP1 performance can be ensured based on DME/DME, provided that the ground transponder can be relied on for part of the integrity budget. Without such reliance, the on-board reasonableness checks cannot detect all identified possible faults. Fortunately, current equipment readily meets this integrity requirement despite not being specified in Annex 10.

The support to PBN encompasses the following working group objectives:

- 1) Improve the robustness of DME infrastructure supporting RNAV specifications to ensure reliable performance in case of a GNSS outage;
- 2) DME infrastructure requirements to permit prolonged support to PBN operations requiring an RNP1 navigation specification in case of a GNSS outage (also called "RNP reversion");
- 3) DME infrastructure requirements and assessment means to fully support RNP operations, including as a minimum (but not limited to) the RNP1 navigation specification. This will include guidance for States to approve RNP operations based on DME.

For the ground functions, the objective is to revise ED-57 to take credit for current equipment performance. In order to provide a clearly documented means for Air Navigation Service Providers (ANSP) to offer an RNP reversion mode based on DME/DME positioning, a separate Minimum Aviation System Performance Standard (MASPS) is developed that explains the overall concept, and describes the various system elements and allocations to both the ground and the airborne segment. The MASPS is envisioned to be a standalone document, while ensuring consistency with ED-75D.

During 2020 EUROCAE WG-85 was reactivated to revise ED-75/DO-236 in a joint effort with RTCA SC-227. To ensure the consistency of the WG-107 deliverables with the upcoming ED-75E/DO-236D, close cooperation between WG-107 and WG-85/SC-227 has been set up.

WG-108 Aeronautical Telecommunication Network (ATN) Using Internet Protocol Suite (IPS)

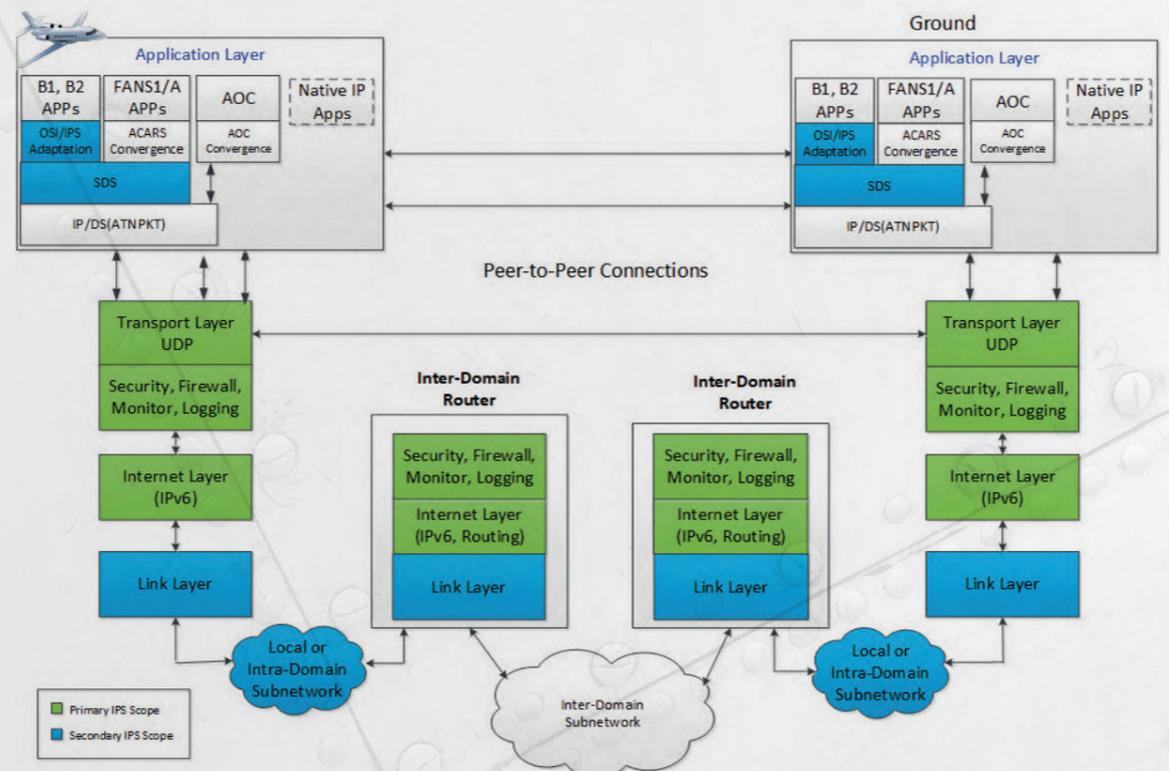
CHAIRPERSON: Stéphane Pelleschi, COLLINS AEROSPACE

WG-108, jointly with RTCA SC-223, published ED-262/DO-379 Technical Standard of Aviation Profiles for Aeronautical Telecommunication Network / Internet Protocol Suite (ATN/IPS), in September 2019.

A revision of that standard was immediately launched to further improve it, following the current ATN/IPS standards development done by ICAO.

In addition, the joint group is working to develop Minimum Aviation System Performance Standard (MASPS) for the end-to-end interoperability supporting certification of the avionics systems and deployment/implementation of the ATN/IPS network.

The work is performed in close coordination with ICAO and Airlines Electronic Engineering Committee (AEEC) of ARINC as well as the entire community, to align the content and availability date of all standards.



WG-109 Runway Weather Information Systems

CHAIRPERSON: Guillaume Roger, DGAC STAC
SECRETARY: Niklas Jost, FRAPORT AG

With the implementation of the Global Reporting Format (GRF), ICAO emphasised the importance of runway condition assessment. To assess aircraft landing and take-off performance on a given runway, aerodrome operators need to evaluate the meteorological contamination of pavements. Runway Weather Information Systems (RWIS) are intended to help the aerodrome operator in assessing and evaluating the runway condition.

To define the performances expected from the systems and the ways of verifying that they are achieving the performance expectations, Working Group (WG) 109 is tasked with developing Minimum Aviation System Performance Standards (MASPS) for RWIS.

Established in May 2018, the working group has already held five plenary meetings and several SG meetings. The number of group participants continues to rise showing the great importance of the work being undertaken.

The group includes participants from about 30 companies from all over the world, representing many stakeholders such as airport operators, sensors & systems manufacturers, aircraft manufacturers, flight crews and civil aviation authorities, thus reflecting both the complexity and the importance of RWIS systems. WG-109 is also working in close cooperation with the ASTM E 17 committee on Vehicle-Pavement Systems. The Group is currently working intensively on the completion of the MASPS.

The need for performance requirements and performance assessment procedures for RWIS is also emphasised by current regulatory developments. ICAO voted to postpone the GRF for one year, so the new applicability date is 5th November 2021, whereas EASA decided that the GRF will be mandatory in Europe on the 12th August 2021.

WG-109 also wants to support the introduction and fulfilment of the GRF by standardising requirements, terminology and performance validation in collaboration with all stakeholders. This marks an important contribution to future runway condition reporting.



WG-110 Helicopter Terrain Awareness and Warning Systems (HTAWSs)

CHAIRPERSON: Yasuo Ishihara
SECRETARY: Mark Prior, UK CAA

Several accidents during offshore helicopter operations have shown that there is a clear need for HTAWSs. Therefore, EUROCAE WG-110 was created to develop MOPS for these systems in support of offshore helicopter operations. The resulting documentation will be analogous to fixed wing RTCA DO-367 Class A TAWS.

WG-110 has worked hard during the last year and together with RTCA SC-237, ED-285/DO-376, the MOPS for offshore Helicopter Terrain Awareness and Warning System (HTAWS) could be finalised by the committee in September 2020 and launched for Open Consultation in the same month.

The main points addressed in this document are:

- ▶ The MOPS is required to form the basis of a technical standard to support the air operating rule mandate made by Rulemaking Task RMT.0708 for aircraft registered after 31 December 2018.
- ▶ The MOPS will promote and facilitate the introduction of appropriate improvements to the safety of offshore helicopter operations defined in UK CAA CAP 1519 and UK CAA CAP 1538.



WG-111 Airport Collaborative Decision Making (A-CDM)

CHAIRPERSON: Segun Alyande, HEATHROW AIRPORT
SECRETARY: Ieyasu Sugimoto, ADB-SAFEGATE

A-CDM is a programme concept aimed at improving operational performance at airports. The programme involves not only the airport operators but also other stakeholders such as: ANSPs, aircraft operators, ground handlers, deciding companies and supporting services.

Many airports have already implemented, and benefited from the efficiencies of A-CDM programs. This is not a new topic for EUROCAE as the first A-CDM standards were delivered back in 2008.

Since 2008 the Airport CDM community has continued to update A-CDM procedures and system features. This functional evolution of A-CDM

and requirements derived from the European Pilot Common Project (PCP) or other domains with close connections to A-CDM triggered the need to update the related EUROCAE documents.

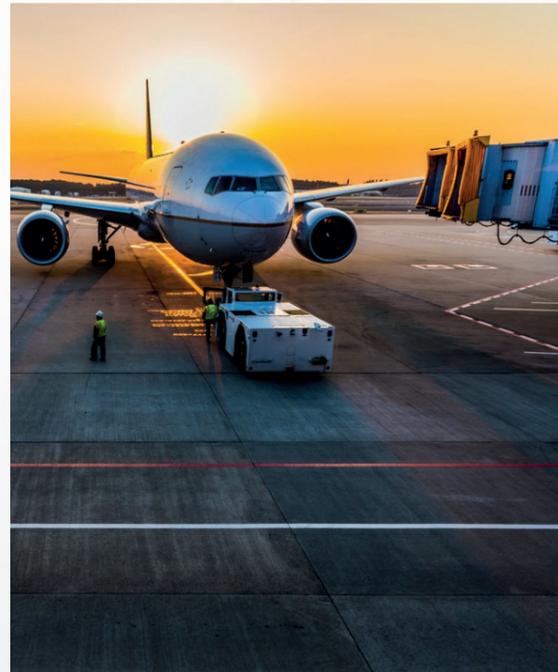
On 26 February 2019, the EUROCAE Council approved the creation of a new Working Group (WG) to address this topic. The WG-111 shall address the PCP which requires an interface of A-CDM to advanced surface movement guidance and control systems (A-SMGCS) with regard to routing and dynamic taxi times. The second topic is the description of the SWIM A-CDM Service definition, providing requirements for the interoperability between the ATM and Airport domain.

The work programme of WG-111 consists of four deliverables:

- ▶ **ED-141A** Minimum Technical Specifications for A-CDM Systems
- ▶ **ED-145A** A-CDM Interface Specification, to include SWIM interface description
- ▶ **ED-146A** Guidelines for Test and Validation Related to A-CDM Interoperability
- ▶ **ED-XXX** A-CDM SWIM Service Performance Specification.

The WG-111 participants representing over 15 organisations, (regulators, airports, ANSPs, manufacturers etc.) are coordinating their efforts and expertise to develop and share best practices for A-CDM implementation.

WG-111 plans to coordinate its work with other relevant initiatives for the benefit of the A-CDM user community.



WG-112 Vertical Take Off and Landing (VTOL)

CHAIRPERSONS: Oliver Reinhardt, VOLOCOPTER and Lionel Wallace, LILIUM

SECRETARY: Alain Vallée and Sebastian Reschenhofer, EUROCAE

On 2 July 2019, EASA published a Special Condition (SC) on VTOL that includes new requirements, addressing peculiarities of this category of aircraft, which use combined lift/thrust units. To provide the related guidance to applicants for these new requirements, EASA sought to ensure appropriate participation of European and International Experts through the development of industry standards.

During a joint EASA/EUROCAE Workshop on 6 June 2019, the urgent need for standards to be developed to support SC-VTOL was confirmed following consultation with key stakeholders from

industry, airspace users, member states, European institutions and academia.

Consequently, EUROCAE Working Group (WG) 112 was created and held its first meeting on 27 June 2019. This activity greatly assists industry in moving forward on current and planned certification programmes and the active involvement of all interested parties is encouraged.

WG-112 set an ambitious timeframe by publishing the first related documents within the first year of its formation. EUROCAE supported the ambitious publishing targets with the introduction of a lean process, using WG-112 as a pilot project. This lean process helped gain valuable time and minimize administrative efforts, whilst maintaining the goal to publish high quality standards and other core principles of EUROCAE.

The WG is structured in 7 SGs:

- ▶ **SG-1** Electrical Systems
- ▶ **SG-2** Lift-Thrust
- ▶ **SG-3** Safety
- ▶ **SG-4** Flight
- ▶ **SG-5** Ground infrastructure
- ▶ **SG-6** Avionics
- ▶ **SG-7** ConOps

On 24 September 2020, WG-112 published the first document, ED-278 Concept of Operations for VTOL Aircraft Volume 1: General Considerations, this publication was achieved within the WG's target time of publishing within its first year of operation. Additionally, WG-112 has currently 29 deliverables in progress, which address different priorities for EASA, and will assist the SC-VTOL with Accepted Means of Compliance (AMC).



WG-113 Hybrid Electric Propulsion

CHAIRPERSONS: Stephan Schliske, ROLLS ROYCE and Sylvain Clary, SAFRAN

SECRETARY: Florian Mahiddini, FLYING WHALES

The aviation industry is witnessing a revolution that will see integration of more electrically powered vehicles. One factor leading this revolution comes from increasing environmental protection requirements: Studies into the electrification of aircraft propulsion revealed the potential of reducing the carbon footprint by 50% between 2005 and 2050 and supporting Advisory Council for Aeronautics Research in Europe (ACARE) goals. This step-change in technology/architecture will require new ways of collaborating among airframers, engine manufacturers and system suppliers. It will also require changes to the related regulatory frameworks and Means Of Compliance (MOC) for these new architectures.

On 9 July 2019 Working Group (WG)-113 was launched and tasked with developing standards and associated documentation relating to development and certification of Hybrid Electrical Propulsion systems. One of the WG's first deliverables was the production of an internal report listing the standardisation needs for Hybrid Electric Propulsion.

After finalising the internal report, WG-113 restructured. The former chair, Guillaume Jouhet, stepped aside after doing great work in leading the WG in its first year of activities.

The new leadership team, consisting of the co-chairs Sylvain Clary and Stephan Schliske, was elected in early September 2020 by the WG-113 plenary. Now, the WG is evaluating possible topics and collaborations to ensure the best support for the industry in the very important topic of Hybrid Electric Propulsion.

WG-114 Artificial Intelligence (AI)

CHAIRPERSONS: Christophe Gabreau, AIRBUS;
Christian Thurow, SEARIDGE

SECRETARIES: Santosh Mathan, HONEYWELL (until July 2020); Emmanuel Letsu-Dake (from July 2020), HONEYWELL

Created in August 2019, WG-114 is tasked with establishing common standards, guidance material and related documents required to support the development and the certification/approval of aeronautical safety-related products based on AI-technology. In addition to the development of EUROCAE documents and reports, the objectives of the working group are to act as a key forum for enabling safe and appropriate adoption and implementation of AI technologies and to enable all aviation stakeholders (e.g. aerospace, airport, ATC manufacturers, etc...) and regulatory agencies to consider and implement appropriate approaches to the certification/approval of AI-based, safety-related products.

WG-114 is working jointly with SAE G-34 to help guide the safe, secure and successful adoption of AI technologies in aeronautical systems.

The work is structured into Sub-Groups (SG) chaired by representatives of both organisations:

- ▶ **SG-1** Airborne & Ground Applications
- ▶ **SG-2** Machine Learning (ML) Data Management & Validation
- ▶ **SG-3** ML Design and Verification
- ▶ **SG-4** ML Implementation and Verification
- ▶ **SG-5** System & Safety Considerations for ML

The current Terms of Reference of WG-114 are listing the following deliverables:

- ▶ EUROCAE Report: AI considerations for development and certification/approval of aeronautical safety-related products: Taxonomy
- ▶ EUROCAE Report: AI considerations for development and certification/approval of aeronautical safety-related products: Statement of concerns
- ▶ EUROCAE Document: AI considerations for development and certification/approval of aeronautical safety-related products: Development standard

WG-115 Counter Unmanned Aircraft Systems (C-UAS)

CHAIRPERSON: Jorge Munir El Malek Vázquez, INDRA
SECRETARY: Patrick Garnier, CS GROUP

WG-115 was created toward the end of 2019 and is tasked with developing standards for the management of unauthorised Unmanned Aerial Systems (UAS) operations around airports. The WGs focus is on the development of performance and interoperability requirements to Counter UAS operations.

The use of unauthorised UAS (also known popularly as "drones") in the vicinity of major airports has significantly impacted airport and flight operations. Many UAS close encounters during approach, landing and take-off of conventional aircraft have been reported, and have an impact on flight safety.

These occurrences regularly lead to the suspension of flight operations, with significant impact on the airport, airlines and the flying public.

To prevent such disruptions, the airspace around airports need to be protected, and unauthorised UAS activities detected and reported at the earliest possible stage to flight crews, Air Traffic Control (ATC), airports and responsible authorities. In accordance with national regulations, neutralisation or disruption of the UAS (either the Unmanned Vehicle, the Command & Control Datalink or the Remote Pilot) could also be considered. Many nations have initiated projects to equip airports with a counter UAS operation capability. IATA, representing airlines, is also very active in the development of mitigation means to ensure the safe and orderly execution of flight operations.

The various efforts mentioned in the previous paragraph target situations such as careless operations of UAS, contingency situations or (intentional) malicious flights, etc. Professional UAS operations can, in general, be expected to follow rules and procedures in place to ensure safe operations. These procedures may involve actions such as registering the operation, filing a flight plan, using proper identification and communication means. The implementation of U-Space will also provide a valuable situational awareness capacity about cooperative UAS operating in U-Space airspaces around airfields.

The first meeting of WG-115 took place on 12 December 2019 and attracted experts from 25 organisations. Participation of representatives from the European Commission (DG Home), EASA and EUROCONTROL demonstrates that this activity fits well in a holistic coordinated action plan. A strong level of collaboration has also been established with military stakeholders: North Atlantic Treaty Organisation (NATO), European Defence Agency (EDA) and German MOD.

EUROCAE WG-115 is a joint WG with RTCA Special Committee (SC) 238, both groups will produce harmonised documents that are technically identical.

According to its Terms of Reference, WG-115 is developing 3 documents:

- ▶ An Operational Services and Environment Definition (OSED) for Counter-UAS in controlled airspace, to be published before the end of 2020,
- ▶ System Performance Requirements (SPR) for non-cooperative UAS detection systems, expected by June 2021,
- ▶ Interoperability Requirements for Counter-UAS systems, available also by June 2021.

Since the kick-off meeting (KOM), WG-115 and SC-238 held 6 virtual plenary meetings and numerous webex working sessions to develop the first deliverable. During the last joint plenary meeting held at the end of September 2020, members agreed to move the draft OSED to the Open Consultation/Final Review and Comment phase, and launched the work on these following 2 documents. An aggressive work plan was agreed to keep up with the timeline.

WG-116 High Voltage

CHAIRPERSON: Rémy Blaujaud, SAFRAN S.A
SECRETARY: Thierry Lebey, SAFRAN S.A

Increases in electrical power requirements and the need to reduce equipment weight, particularly of electrical wiring, has led to the need for an increase of voltage levels in electrical systems in aeronautics.

The increase in voltage levels comes with new risks and technical problems. How to define new interface specifications between equipment and systems to be connected to the new high voltage networks? How to deal with the associated new risks of high voltage installations, protections, ageing of insulating materials and human safety?

WG-116 is tasked with defining new standards to mitigate these issues and help the industry and the certification authorities to develop and certify new

designs for electrical and hybrid aircraft, where electrical voltages will be much higher than the current applications.

Since its creation in March 2020, EUROCAE WG-116 has organised and scoped the activities of 65 participants from 25 organisations in 10 countries, representing many stakeholders. The stakeholders include legacy aircraft manufacturers and new comers, aircraft engine manufacturers, electrical equipment and systems manufacturers and the civil aviation authorities. WG-116 will also work in close relationship with WG-112 and WG-113, while coordinating activities with SAE AE7.

At the end of 2020, the WG will be split into four dedicated Sub Groups that will increase the overall efficiency of the WG and help achieve the objective of a first document delivery in June 2022.

WG-117 Topics on Software Advancement

CHAIRPERSONS: Burak Ata, VOLOCOPTER and Stephen Cook, NORTHROP GRUMMAN
SECRETARIES: Fabrice Ferrand, SAFRAN and Andy Hoag, AIREON

In 2019, the Forum on Aeronautical Software (FAS) Ad Hoc Unmanned Aircraft System (UAS) report identified the need to create additional guidance in the areas of Commercial off-the-shelf (COTS), Open Source and Service History for all users of ED-12C/DO-178C. While this additional guidance could apply to all aviation software, it is seen as especially useful for stakeholders focused the development on lower-risk applications, e.g. UAS, General Aviation, VTOL.

The certified UAS category is aligned with the ED-12C/DO-178C document suite for development. However, the open category does not have a software development standard, and the specific category does not currently have a comprehensive compliant development standard to provide assurance as to the safe operations of the UAS. The continued release of information

on UAS development and UAS operations by EASA provides an opportunity for a new software development standard that will be tailored to lower risk UAS applications and the specific category defined by EASA.

The creation of WG-117 was approved by the Council in February 2020. And the activity is jointly organised with RTCA Special Committee SC-240.

The first meeting of WG-117/SC-240 was held on 19 May 2020. Main topics were the election of the leadership team, definition of the WG structure, workplan, and a future meeting schedule. The EUROCAE chair and secretary, Burak Ata and Fabrice Ferrand, along with the leadership team of RTCA SC-240, Steve Cook and Andy Hoag will lead the activities. The plenary also agreed to structure the work in two SGs, one per deliverable.

- ▶ SG-1 Low Risk Applications Equipment Certifications and Approvals
- ▶ SG-2 COTS Open Source and Service History

WG-118 Crash-Protected and Lightweight Flight Recorders

CHAIRPERSONS: Jennifer Weiss, FLIGHT DATA SYSTEMS and Hannes Griebel, GRIEBEL AEROSPACE
SECRETARY: Robin Hudson, LEONARDO DRS

During several investigations of incidents and accidents involving commercial air transport (CAT) operations, accident investigators identified a need to improve the quality of recorded information, in particular the quality of voice recordings.

Accident investigation authorities issued safety recommendations to consider whether a repeatable and objective analysis technique can be applied to audio recordings to establish consistent performance of cockpit voice

recorder (CVR) systems. The ICAO flight recorder specific working group (FLIREC-SWG) was also recommending an update, and the inclusion of crew-machine interface recording, as this is required by ICAO Annex 6 provisions. Since 2016 ICAO Annex 6 also prescribes means for the recovery of flight recorder data in a timely manner for new types of large aeroplanes. One solution to address these provisions is a deployable flight recorder. The possibility of using deployable flight recorders in order to meet certain air operation requirements and associated installation requirements (Certification Specifications (CS) for large aeroplanes, CS-25.1425) is also driving the need to review this area of the standard.

In addition, in 2019 the EU adopted flight recorders carriage requirements applicable to newly manu-

factured aeroplanes and helicopters with a maximum certified take-off mass (MTOM) equal to or above 2250 kg. In the framework of the rulemaking task that led to the adoption of these requirements, some differences with ED-155 were identified. Differences such as the minimum recording duration or the minimum list of flight parameters.

As a consequence, EASA recommended an update to the European Technical Standard Order (ETSO-C124b), which refers to the EUROCAE standards ED-112A, Minimum Operational Performance Standard (MOPS) for Crash Protected Airborne Recorder Systems and ED-155 MOPS for Lightweight Recording Systems. The aim of the update is to include several technical sections directly in the performance standard. Having currently no existing WG addressing flight recorders within EUROCAE, the Technical Advisory Committee (TAC) recommended the establishment of a new WG and initiated the update of these documents.

WG-118 on Crash-Protected and Lightweight Flight Recorders was approved by the Council in February 2020 and held its first meeting on 10 June 2020.

WG-119 Radar Altimeters (RA)

CHAIRPERSON: Jean-Luc Robin, AIRBUS

WG-119 is a new working group addressing Radar Altimeters. The primary objective of WG-119 is to develop an updated Minimum Operation Performance Standard (MOPS) that will address the RA robustness against the existing, and planned future RF environment.

ED-30A: MOPS for Low Range Radar Altimeters; Target date: Q4 / 2022

This future RF environment is combining all the following interferences concurrently:

- ▶ Interferences at the edges of the RA band (3.800-4.400MHz) and (4.400-5.000MHz) including anticipated futures modulations and signal strength

This activity greatly assists in updating the existing MOPS for airborne flight recorders, which are mandated by operational regulations and ICAO Annex 6 requirements aiming to provide the necessary data for accident investigation and prevention.

In particular, WG-118 should update ED-112A to address:

- ▶ the recording of the information displayed to the flight crew from electronic displays,
- ▶ the operation of switches and selectors by the flight crew,
- ▶ voice recorder audio quality assessments and
- ▶ development in deployable recorders.

For EUROCAE, who is the only standardisation organisation active and experienced in flight recorder standards, this activity is well supported and the organisation highly appreciates the encouragement and motivation of the involved members. After finalisation of ED-112B in approximately 24 months, WG-118 will update ED-155 and keep the unique EUROCAE standards on flight recorders up to date with modern aviation standards expectations.

- ▶ Interferences within the RA band (4.200-4.400MHz)
- ▶ Out of RA band interferences that could potentially have an indirect effect on the RA due to: level of signal, modulation, potential harmonics, RA antenna potential weakness (susceptibility), RA design potential weakness (resonance).

The first meeting of WG-119 took place on 27 May 2020 as an online meeting. Twenty registered participants from two continents joined the meeting, which provided the framework for the next steps of this activity.

WG-119 is working jointly with RTCA SC-239. The current ED-30 and DO-155 are not technically identical; one of the aims of this revision is to align these documents and to develop technically identical documents (ED-30A/DO-155A), which will supersede the current ED-30 and DO-155.

WG-120 Technical means for identifying potential Covid-19 carriers among passengers

CHAIRPERSON: Mike Horne, LATECOERE
SECRETARY: Sara Einollahi, AD AERO

WG-120 is a new Working Group (WG) tasked with recommending the best technical means for identifying potential COVID-19 virus carriers among passengers.

In early 2020, worldwide aviation was brought to a halt by the COVID-19 pandemic. The virus was rapidly transmitted worldwide by the prevalence of air travel and resulted in outbreaks and fatalities worldwide. The virus is spread by the transmission of droplets and is particularly transmitted in enclosed areas like aircraft cabins. As a result, the airline business has dropped by more than 90% and with "social distancing" requirements aircraft may, in the foreseeable future, have to limit the number of available seats. This would signal the end of low-cost travel and puts airlines in a serious financial position.

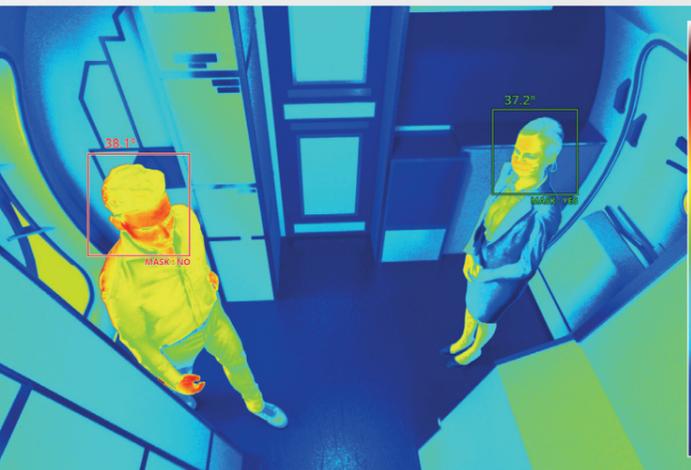
One of the main characteristics of patients carrying the virus is a fever of higher than 38°C, and this temperature can be easily sensed by a thermal camera. Such technology is already in wide use at some airports, particularly airports in the Asia Pacific region.

The WG is tasked with defining the specification and parameters of sensors which could be used onboard commercial aircraft to monitor the temperature of passengers. Timely information could alert cabin crew to passengers showing symptoms of a fever. Ideally, if the symptoms were detected, at the aircraft door during the boarding process, passengers showing traces of a fever could be quickly isolated from other persons on board the aircraft. A camera system would also allow the cabin crew to automatically check whether masks are being worn. The objective of this piece of equipment will be to help the airline industry better manage the on board COVID-19 transmission threat and provide passenger reassurance. Passenger reassurance is one of the key elements of the recovery of the aviation industry.

The WG will build on the framework driven by the ICAO "Collaborative Agreement for the Prevention and Management of Public Health Events in Civil Aviation" (CAPSCA) and the EASA Aviation Industry Charter for COVID-19.

The first meeting of WG-120 took place on 9 September 2020 and gathered representatives of 13 organisations in this domain of expertise.

The MOPS for Thermal Camera Systems is expected to be published in September 2021.



WG-121 Aircraft Cleaning

CHAIRPERSON: Manfred Mohr, IATA
SECRETARY: Patrick Guerin, UNITED AIRLINES

Due to the public health situation created by the spread of the novel Coronavirus disease (COVID-19), travel restrictions were implemented by many nations worldwide to stop the spread of the disease. The aviation industry recognised the seriousness of the threat of infection and moved to restore confidence of the traveling public that the aircraft and the entire service chain in which they travel are safe from transmission of the disease. Modern air travel requires proven methodologies to clean aircraft interiors, such as, but not limited to, the cabin, galley, lavatories, cargo compartments and flight deck.

The EUROCAE Council approved the establishment of WG-121 in early August 2020. The first meeting of WG-121 was a joint meeting with RTCA Special Committee SC-241 and took place on 20 August 2020 with around 50 international participants.

WG-122 Virtual Centre

CHAIRPERSON: Philippe Chauffoureaux, SKYGUIDE
SECRETARY: Ben Stanley & Maja Marciniak, HELIOS

The latest developments in Europe in support of the modernisation of ATM led to the development of 2 important documents. The Airspace Architecture Study (AAS) report, and the European Air Traffic Management Master Plan (ATM MP), 2020 edition, whose subtitle is "Digitalising Europe's Aviation Infrastructure". The AAS Transition Plan (TP) provided more details on the timeline and the required elements to progress towards this digitalisation. One of the key common elements of these three strategic documents is to implement virtualisation and digitalisation of ATM, in particular via virtual centres. The virtualisation and digitalisation of ATM via virtual centres has been identified for some years in the EUROCAE Technical Work Programme (TWP) as a future activity, and was also one of the outcomes of the 2019 EUROCAE Symposium held in Toulouse. Following a large stakeholder workshop, the EUROCAE Council approved the creation of

Even though EUROCAE and RTCA are operating outside their range of usual standardisation activities, both are flexible and willing to support this very urgent and important topic. The collaboration between the two organisations is essential for the success of this activity, as a global standard is needed to ensure safety for passengers worldwide.

The WG is structured in three SGs, namely Document Review, Compatibility of Chemicals and Non-Chemical. The reason for the SG structure is to ensure that no existing material is duplicated and all various options of cleaning are being considered. The plenary agreed on a very ambitious timeframe and is looking forward to publishing the guidance by the end of 2020. To ensure this deadline, EUROCAE and RTCA are keeping administrative tasks and processes to a minimum. Therefore, the Open Consultation and the FRAC time was reduced to 28 days.

WG-122 Virtual Centre. The first meeting of WG-122 was held on 13 November 2020.

WG-122 is tasked to develop standards and related deliverables to support the implementation of the virtual centre concept.

The initial task shall be to develop a comprehensive report, outlining the context, and providing a detailed work programme, for future standardisation activities, while in particular, taking into account the status of R&D activities and the stakeholder needs. The report will provide a detailed analysis of the current context, including R&D status/maturity, industrialisation status, political and regulatory aspects, as well as a comprehensive standardisation work programme, with deliverables, timelines and priorities associated to each proposed activity. The report should be initiated asap and be planned as a short-term deliverable to ensure that any ensuing standardisation activities can be launched in a timely manner, following an incremental, iterative approach in line with the evolution of the R&D activities and stakeholder needs.

Forum

FAS Forum on Aeronautical Software

The Forum on Aeronautical Software (FAS) has been established to provide a forum for those involved in the development of aeronautical software to share experiences and good practices and to provide a platform for the exchange of information regarding subjects addressed in the “software document suite”, new and emerging technologies, development methodologies, interesting use cases and other topics related to aeronautical software and related technologies.

The goals of the FAS are:

- ▶ to share lessons learned in the use of the “software document suite” and to encourage good practices and promote the effective use of RTCA’s and EUROCAE’s publications.
- ▶ to develop FAS Topic Papers related to subjects covered by “software document suite” or other related aeronautical software industry topics.
- ▶ to identify and record any issues or errata showing the need for clarifications or the need for modifications to the “software document suite”.

The FAS is a joint RTCA/EUROCAE User Group that holds discussions and develops information papers called FAS Topic Papers (FTP) relating to aeronautical software topics in efforts to harmonize these information papers; they are made available for educational and informational purposes only. FTPs are published on the EUROCAE and RTCA websites.

Topics typically addressed by the FAS relate to aeronautical software, including topics covered by the following set of EUROCAE/RTCA published documents (referred to as the “software document suite”):

- ▶ ED-12C Software considerations in airborne systems and equipment certification
- ▶ ED-94C Supporting Information for ED-12C and ED-109A
- ▶ ED-109A Software Integrity Assurance Considerations for Communication, Navigation, Surveillance and Air Traffic Management (CNS/ATM) Systems
- ▶ ED-215 Software tool qualification considerations

- ▶ ED-216 Formal methods supplement to ED-12C and ED-109A
- ▶ ED-217 Object-oriented technology supplement to ED-12C and ED-109A
- ▶ ED-218 Model-based development and verification supplement to ED-12C and ED-109A

The FAS is meeting regularly online as well as – more rarely – F2F.

In the spring of 2018, RTCA and EUROCAE asked the FAS to consider the question whether ED-12/DO-178, and the various supplements, were appropriate for use on projects developing systems that would operate unmanned or whether the documents could be tailored to meet UAS industry demands for low-cost, nimble, and easily applied software guidance material. The final report of this Ad Hoc group is now available and follow up actions are being coordinated between EUROCAE and RTCA. As a result of this comprehensive report developed by the FAS, and to implement several of the recommendations of this report, EUROCAE and RTCA jointly launched WG-117 / SC-240 (see below), looking at software for low-risk applications (e.g. UAS, GA, VTOL) as well as COTS, Open Source and Service History aspects.

In 2020, FAS bid farewell to Hervé Delseny, Airbus, who had led the FAS as EUROCAE Co-Chair for many years. The FAS welcomed Christophe Cucuron, Airbus, as new EUROCAE Co-Chair to lead the FAS along with Patty Bath, Avista, Inc, RTCA Co-Chair.



European ATM Standards Coordination Group (EASCG)



Since its creation in 2015, the European ATM Standards Coordination Group (EASCG) has developed and maintained the ATM Rolling Development Plan (RDP), the value of which is well recognised and which is often used by the ATM community in Europe and beyond.

The EASCG met several times over the year, developing the RDP up to v12. The RDP brings together all relevant standardisation activities that are on-going or planned within the various Standard Developing Organisations (SDOs). It is updated regularly, twice a year, in order to maintain visibility and awareness of the progress.

EASCG discussed on the validation of standards, and delivered a position paper on the various stages in the standards development process to the European Commission. Complementing this position paper, the EASCG provided a detailed description of validation activities associated to each step of the standards development process.

This year, the EASCG also took on a new activity: As the European platform bringing together all relevant organisations, EASCG also considers the need for standards coming from the Airspace Architecture Study (AAS) Transition Plan (TP) implementation.

The AAS was presented in March 2019, and highlighted that, "without an acceleration of ATM modernisation and complementary changes, the situation of air traffic delays will continue to deteriorate to an unprecedented level".

The subsequently published "Future architecture of the European airspace - Transition Plan", strengthens the fact that connection between R&D, standardisation and regulatory work is a key element. Several measures are noted to support this transition, including areas where standardisation is needed, e.g. to support the industrialisation phase of SESAR technologies and services.

As noted in the AAS-TP, EASCG will continue to monitor the developments and evaluate, which new standardisation activities might be needed in order to support the community in the implementation of SESAR R&D results and enabling accelerated market uptake.

For more information and to download the latest version of the RDP please visit
www.eascg.eu
www.euscg.eu
www.ecscg.eu

European Cyber security for aviation Standards Coordination Group (ECSCG)

The European Cyber security for aviation Standards Coordination Group (ECSCG) is a joint coordination and advisory group established to coordinate the cyber security for aviation related standardisation activities. Its purpose is to coordinate the cyber security-related standardisation activities across Europe to ensure that the necessary and appropriate standards are available in due time.

The ECSCG also acts as a bridge for similar international developments outside of the region. Considering that only finite resources are available, it is important to limit overlaps between the different initiatives. It is also important to ensure interoperability of the systems and compatibility of the relevant standardisation activities in Europe and globally.



ECSCG gathers experts from the European regulators (European Commission and EASA) as well as European organisations active in cyber security and international SDOs to discuss the terms of reference of the Coordination group with the goal to define a way to streamline standards developing activities in Europe.

The main deliverable of the ECSCG is the European Cyber security for aviation Standardisation Rolling Development Plan (RDP). The RDP lists

and categorises standardisation and regulatory activities, providing a method for the identification and discussion of overlaps and gaps.

As a basis for feedback to contributing organisations, it will improve overall coordination of standards development. Following a first version published in 2019, V2.0 is now available. More information on the ECSCG and the European Cyber security Standardisation Rolling Development Plan are available on the ecscg.eu website.

EUSCG



Established in 2017, European UAS Standards Coordination Group proved to be an important tool to ensure a harmonised approach to seek integration of UAS both at regulatory and operational levels in the existing aviation framework but also to streamline the UAS standardisation activities.

EUSCG gathers experts from the European regulators (European Commission and EASA), Standard Developing Organisations (SDOs), UAS manufacturer and user representations, to define and develop the Rolling Development Plan (RDP). The RDP itself illustrates nicely the bigger picture of UAS standards published or in drafting phase as well as the regulatory side. Five RDP updates were published since EUSCG started its activity, to keep it up to date and accurate. The latest RDP version is available on the specialised website www.euscg.eu.

In September 2020, EUSCG approved the Position Paper "Future of EUSCG" to be presented to the European Commission.

The main stakeholders reaffirmed their support to EUSCG acknowledging the usefulness of accomplished work and the need to continue to serve the UAS community as a neutral platform. At the same time during these 3 successful years of operation of EUSCG the environment has changed and there was a need to assess the activity of this coordination platform and see what adaptation could be performed to serve the UAS community in a more efficient and effective way, preserving its status of a neutral platform and the quality of its deliverables.

In this context, EUSCG members agreed to investigate potential adjustments to make it more beneficial for the European and global industry and also to ensure a better regulator-SDO connection.

E-LEARNING

online education

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DUE TO THE RECENT DEVELOPMENT OF THE COVID-19 DISEASE, TRAVEL LIMITATIONS AND OTHER RESTRICTIONS IN PLACE, EUROCAE DECIDED TO SUSPEND ALL CLASSROOM TRAININGS UNTIL FURTHER NOTICE. ALL EUROCAE TRAININGS ARE, OR WILL BE TRANSFORMED INTO AN INTERACTIVE, VIRTUAL FORMAT.

Training: Aviation Software Standards Applied to ATM

With airborne and ground-based aviation systems increasingly interconnected, the landscape for critical systems software is changing.

Civil aviation is a sector where critical software components (both air and ground sectors) are increasingly present. Furthermore, new technologies such as e-enabled aircraft, computer-based concepts and new technologies and concepts such as A-SMGCS, APW, ADS-B and drones have changed the safety risk landscape of the aviation system.

At the same time, there is growing demand for guidance and clarification on the way some principles and methodologies are integrated in the lifecycle of critical aviation software systems and components.

Whether you are an ANSP specifying or accepting a system, the person responsible for system maintenance, or a supplier at the cutting edge of software product development, you will need to understand the standards options available to you, how to apply them, and the impact on costs.

This course takes a practical and interactive approach to the subject matter, drawing on the trainers' extensive experience in both aviation safety and critical systems software development. Attendees will receive complimentary copies of ED-12C, ED-109A and ED-153.

WHO SHOULD ATTEND?

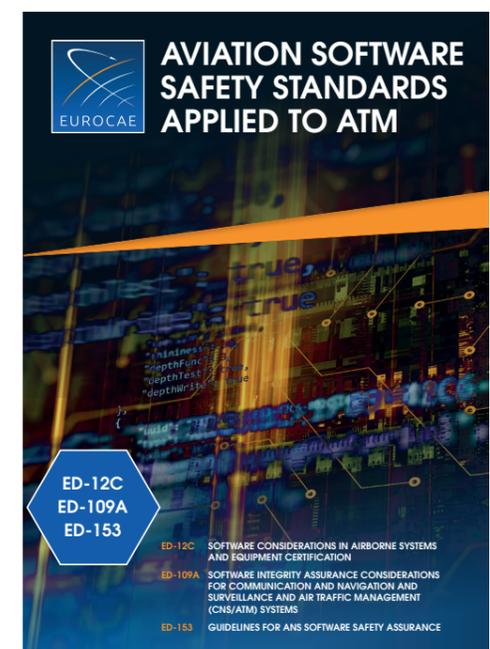
ANSPs: safety & quality managers, technical department heads, maintenance managers; systems manufacturers and software tools providers: product assurance managers, quality managers, conformity managers, compliance managers, product development managers, technical department managers; aviation software developers from around the world.

COURSE CONTENT

- ▶ Aviation software context and standards landscape
- ▶ Software development processes common to ED-12C, ED-109A & ED-153
- ▶ Software safety in airborne systems: ED-12C
- ▶ Software safety in ATM/CNS systems: ED-109A
- ▶ Software safety in ATM/CNS systems: ED-153.

BENEFITS OF ATTENDING

- ▶ Participants will understand which standard to use for what purpose and at what cost implications.
- ▶ EDs for Aviation Software brought to life with application scenarios and exercises.
- ▶ Instructors are senior advisers on aviation software and experienced trainers.
- ▶ Sharing experiences with colleagues from other aviation stakeholders/countries.
- ▶ Extensive course handouts including ED-12C, ED-109A and ED-153.
- ▶ Certificate on completion of the course



Training: Aviation Cyber Security Standards

Civil aviation is an increasingly attractive target for cyber-attacks. New technologies such as e-enabled aircraft, new generation CNS/ATM systems and drones are changing the risk landscape of the aviation system and authorities are responding with regulations.

At the same time, there is growing demand for guidance and leadership in cyber security, where EUROCAE WG-72 has brought a significant technical contribution through five EDs: ED-201, ED-202A, ED-203A, ED-204A and ED-205. Standards and guidance are proliferating in this space, which makes it potentially confusing for aviation stakeholders to know which is appropriate for what purpose. Guiding people through this maze is a key goal of this NEW training course.

WHO SHOULD ATTEND?

Anyone working in aviation (airport, ANSP, airline, manufacturing industry (developing, producing or maintaining aircraft) plus regulatory and industrial audiences, who needs to deal with cyber security as part of their day-to-day activities. This includes managerial, technical and operational people who need to understand the regulatory and standards landscape to establish secure organisations and processes. Note that this training provides an overview of standards and regulations and how they interrelate. This course is complemented by additional courses that will provide a more in-depth understanding of specific topics covered by individual standards.

COURSE CONTENT

- ▶ Cyber threats in aviation
- ▶ The current cyber security regulatory landscape affecting aviation
- ▶ The current cyber security standards landscape
- ▶ ED-20X standards for airworthiness and securing the aviation sector
- ▶ Cyber security auditing and certification
- ▶ Standards for securing organisations including information and operational technology
- ▶ Future developments.

LEARNING OBJECTIVES

- The purpose of the training is to enable participants to adopt a standards-led approach to cyber security in aviation. The participant will be able to:
- ▶ Identify the principles and consequences of cyber security in the aviation environment.
 - ▶ Describe how cyber security impacts different actors in aviation.
 - ▶ Understand which regulations apply to a particular aviation organisation
 - ▶ Explain the scope and contents of ED-20X.
 - ▶ Identify the interdependencies between the different standards by mapping the links between them, including ED-201 to ED-205, EN-16495, ISO27000 series, NIST standards, DOs and SAE documents.
 - ▶ Select an appropriate standard, or set of standards, to adopt for specific aviation purposes.
 - ▶ Research the process to follow and the information required for internal/external audits within an aviation context.
 - ▶ Describe the top-level cyber security processes and aspects of certification in an ATM and aircraft context.

BENEFITS OF ATTENDING

- ▶ Certificate of completion of the course.
- ▶ Participants will gain access to the tools and understanding to use available standards to manage cyber risk in an aviation context in a standards-led way (which in itself brings many additional benefits).
- ▶ Learn best practice on auditing and certification.
- ▶ Instructors are leading experts on aviation cyber security.
- ▶ Share experiences with colleagues from other aviation stakeholders/countries.
- ▶ Extensive course handouts including ED-201, ED-202A, ED-203A, ED-204A and ED-205.

Training: Unmanned Aircraft Systems Airworthiness and Safety

Operations of Unmanned Aircraft Systems, through a variety of configurations, applications and types of operations, are increasingly becoming a reality in the world of civil aviation. New European Regulation, based upon risk-based approach, has been put in place in June 2019 and will be applicable on 31 December 2020, endorsing the three pillars concept of Open, Specific and Certified categories for UAS operations.

EUROCAE (through its dedicated Working Groups, initially WG-73 and WG-93 and WG-105 since November 2016) has played and is playing an active role in the UAS-rule making and standardisation activities. A number of standards and guidelines documents (ED and ER documents) have been already issued to handle various topics relating to UAS Airworthiness and Operational Safety and to enable the safe integration of UAS in the civilian airspace. This training course aims at familiarising the audience with the issues related to the UAS Airworthiness and Safety. In particular, It presents the essential tools to conduct System Safety and Operational Risk Assessment, based upon design and operational risk mitigation measures, which is a key element in getting flight authorisation from Civilian Aviation Authorities (in the framework of Specific and Certified Categories, as per EC regulation 2019/947).

COURSE CONTENT

- ▶ The world of UAS and the world of certification: an overview
- ▶ UAS regulatory landscape and approach
- ▶ A glance at current EUROCAE UAS standards and guidelines
- ▶ Conducting UAS System Safety assessment and Operational Risk assessment (considering risk based approach)

LEARNING OBJECTIVES

The course aims at encompassing the whole subject of UAS Airworthiness Certification (in EASA terminology "Specific" and "Certified" categories).

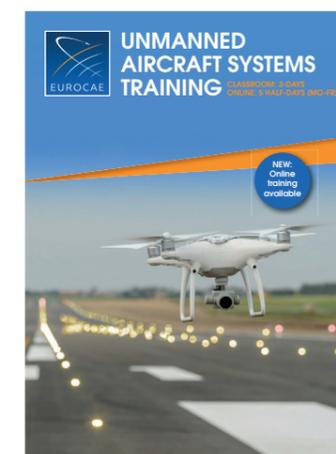
It is hoped that the participants will subsequently get a quite complete picture while "zooming" into a number of peculiar issues, such as Safety Assessment process activities and Operational Risk Assessment. Whilst this 15-hour course does not claim to make the participants technical experts in these disciplines, it will allow them to get a good appreciation of the various tools and methods supporting the UAS flight authorisation or airworthiness certification process.

The participant will be able to:

- ▶ Get a sufficient knowledge and comprehensive view of the UAS regulatory framework and flight approval / certification process;
- ▶ Identify the risks related to UAS operations;
- ▶ Get familiarised with the UAS Safety Assessment process;
- ▶ Apply the risk-based approach based upon design and/or operational mitigation measures;
- ▶ Prepare inputs to Operational Risk Assessment in line with SORA methodology to support the granting of flight authorisation.

WHO SHOULD ATTEND?

Anyone involved in UAS design, manufacturing and operations who is involved in the process of flight authorisation granting by Civil Aviation Authorities. This includes managerial, technical and operational people (UAS Industry, Operators but also Authorities).



57TH GENERAL ASSEMBLY

As a result of the situation created by the COVID-19 crisis, the 57th General Assembly was postponed to October and for the first time was exclusively held online.

The President Francis Schubert introduced the meeting and Jean-Christophe Albouy, as Chairperson of the Council, as well as Christian Schleifer, Secretary General, presented the main activities and achievements for the May 2019 - October 2020 period. The General Assembly approved the financial report and elected the Council members. The President's office remains vacant as no candidacies were received.

As it was for both the President and the Council Chair last mandate, the General Assembly expressed its gratitude to Francis Schubert and Jean-Christophe Albouy for their continuing support and trust.

It was immediately followed by a Council which elected Mr Bruno AYRAL from THALES LAS France, as Chair, thus opening up a new era for EUROCAE.

EUROCAE VISION

The European leader in the development of worldwide recognised industry standards for aviation.

EUROCAE MISSION

In support of EUROCAE's Vision the Mission of the organisation is defined as:
Develop standards by industry/members for the industry needs that:

- ▶ build upon the state of the art expertise of its members and address the global aviation challenges
- ▶ are fit for purpose to be adopted internationally
- ▶ support the operational, development and regulatory processes

STRATEGY LINES

- ▶ Strengthen the role as one of the leading international Aviation standardisation organisations.
- ▶ To increase our global footprint and international relationships.
- ▶ Increase the efficiency of the EUROCAE's standardisation development activities.
- ▶ Ensure EUROCAE's sustainability and independence.

KEY OBJECTIVES 2020

- ▶ Deliver standards in accordance with the approved TWP 2020.
- ▶ Perform the duties necessary to fulfil the leadership function of the European ATM Standards Coordination Group (EASCG), the European UAS Standards Coordination Group (EUSCG) and establish the European Cyber security in aviation Standards Coordination Group (ECSCG).
- ▶ Perform the duties as defined in the EC-EUROCAE grant agreements.
- ▶ Perform the duties as necessary for an effective Communication and Public Relation (PR) plan.
- ▶ Implement the EUROCAE legal status recommendations to address in the most efficient way EUROCAE's needs, business and interests.
- ▶ Implement, maintained and further develop the EUROCAE Quality Management System (QMS) based on the process management structure.
- ▶ Support the processes by implementing and improving the automation system.
- ▶ Review the EUROCAE partnership agreements for effectiveness and execution, perform annual/periodic meetings as defined and required.
- ▶ Further increase and complete the membership of airspace users and airports.
- ▶ Continue execution of EUROCAE/EASA Framework Contract through Specific Contracts (SCs).
- ▶ Increase revenue from sales and distribution of ED documents, protect EDs against illegal downloads and distribution.
- ▶ Implement the EUROCAE training strategy and rollout of the 2020 training program with additional products.

Financial Report

EUROCAE is composed of the not-for-profit organisation, EUROCAE Association, as well as its 100% subsidiary, EUROCAE Communication.

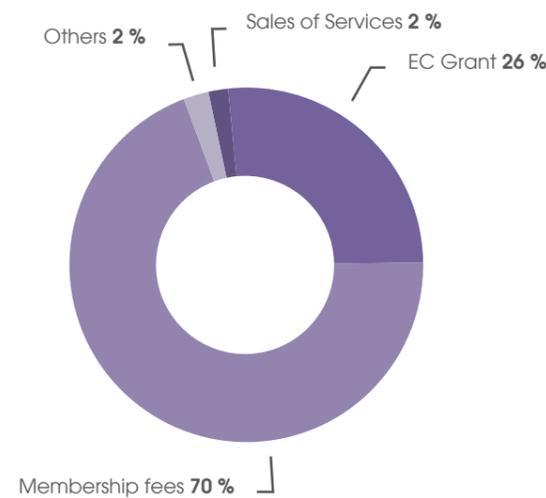
EUROCAE generates the largest part of its income through membership fees, a bi-annual EC Grant, and revenue generating activities undertaken by EUROCAE Communication. EUROCAE expenditures primarily involve office space rental costs, labour and social security costs, taxes and travel costs. EUROCAE Communication revenues are generated primarily from the sale of EUROCAE

Documents (EDs), training sessions, events, engineering and consultancy contracts.

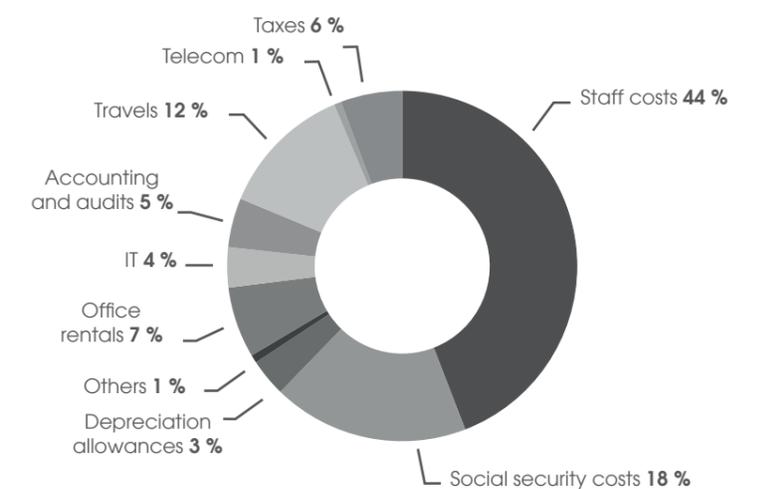
Office rents, taxes, charges, and service/supplier payment costs are shared relatively equally between EUROCAE Communication and EUROCAE, as per a cost sharing agreement.

As in past years, the accounts of our 2 entities have again been fully audited. Neither of the 2 audits conducted revealed any adverse findings.

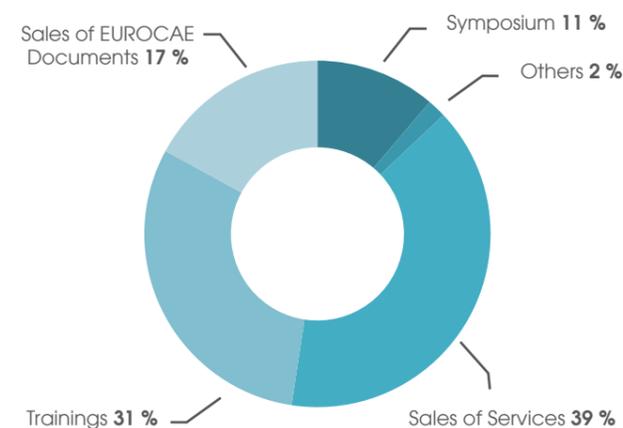
EUROCAE OPERATING INCOME:



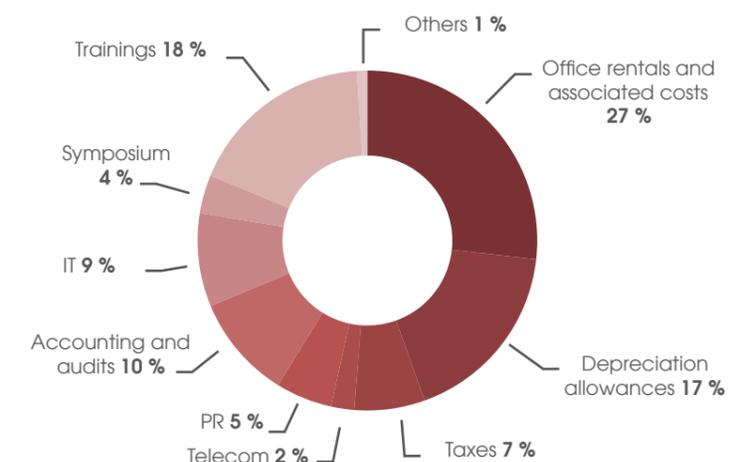
EUROCAE OPERATING EXPENSES:



EUROCAE COMMUNICATION OPERATING INCOME:



EUROCAE COMMUNICATION OPERATING EXPENSES:



Stakeholder engagement: Japan

Perusing our EUROCAE stakeholder engagement plan, Secretary General, Christian Schleifer and Director Technical Programme, Anna von Groote met with our Japanese partners and industry during a visit to Tokyo in the autumn 2019.

The 6th Electronic Navigation Research Institute (ENRI) International Workshop on ATM and CNS (EIWAC 2019) took place on 29 – 31 October.

In a special speech on the second day of the conference, Christian Schleifer addressed the audience and provided information on current and future EUROCAE standardisation activities, concluding with an open invitation to the present stakeholders – global standards need global participation.



Secretary General Christian Schleifer joined a panel on digitalisation in aviation, and discussed with the other panellists from ICAO, RTCA, NASA and JCAB how to best accommodate new entrants and to keep up with the pace of technology from a standardisation and regulatory perspective.

This visit was also an opportunity to meet with new partners, such as *Narita Airport*, which is interested in many of the activities related to innovative technology, preparing to accommodate the an expected increase of air traffic in Japan, especially during the 2020 Olympics.

Kawasaki Heavy Industries is another important player in the manufacturing industry, producing aircrafts, helicopters, engines and different structural parts for several manufacturers. Discussions showed many common areas of interest and further exchanges will take place soon.

In addition we met with high level representatives of the *Japanese Civil Aviation Bureau JCAB* to learn more about Japan's current aviation policy, status of the CARATS programme, challenges and future work.



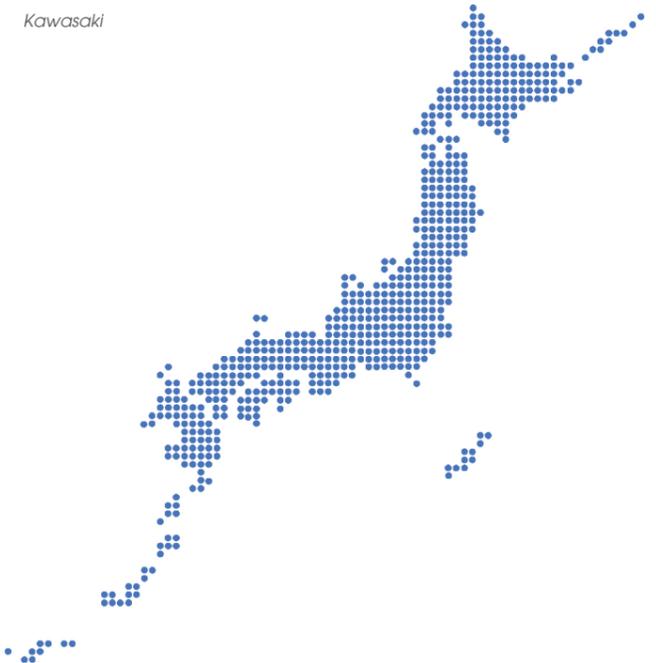
Kawasaki

In follow up to the 2018 initiative, we met again with the Tokyo University Aviation Study Group, convened by Professor Shinji Suzuki, and had a very good discussion on the involvement of Japanese stakeholders in international standardisation activities, with a special focus on regulatory environment and standardisation work for UAS and VTOL.

To conclude the stakeholder engagement visit to Japan, EUROCAE attended a conference organised by JAXA, the Japan Aerospace Exploration Agency, to discuss emerging technologies in aviation and their standardisation.

In the aviation domain, JAXA is primarily focusing on promoting research and development of new "environment-friendly" and "safe" technology necessary for future aviation transportation. This focus is being pursued in cooperation with industry partners, universities, and overseas organisations, and is based on the policy of the Japanese government and social needs.

JAXA recognises that international standardisation is one of the keys of R&D success, and therefore organised a whole day of discussion with ICAO, RTCA, SAE and EUROCAE as well as ENRI. The objective of the discussions was to raise the awareness of JAXA's management and researchers to emerging international aviation issues and the relevance of global standardisation in implementing R&D results. It was also a good opportunity for EUROCAE to learn about and discuss with JAXA's managers and researchers their impressive activities in the aviation and space domain.



JCAB



Meeting with AIDA

EUROCAE's engagement in China

In recent years, EUROCAE has seen a significant increase in engagement with Asia-Pacific based organisations that are interested in understanding and benefiting from the "European Standards" based regulatory framework processes.

In April 2019, and as a direct result of the increase in engagement with Asia Pacific operators, EUROCAE entered into a working relationship with a Chinese organisation called "Galleon". Galleon operates as a relationship facilitator between Chinese aviation companies and other organisations.

On 23-24 November 2019, EUROCAE Secretary General Christian Schleifer participated in the 3rd Unmanned Aircraft Systems (UAS) Standard Development and Application International Forum. It was an event held in China and dedicated exclusively to UAS standardisation. For EUROCAE it was an opportunity to promote its activities and to increase its global footprint. It was also an opportunity for us to invite Chinese and other Asian organisations to join or coordinate their activities with EUROCAE activities in various fields of mutual interest. As a main topic of presentation to the Forum, the Secretary General described how a EUROCAE standardisation activity takes place from its inception to the publication of a standard, and the role of a standard in the European regulatory framework process. The Secretary General then went on to present in more detail some examples of standard developments related to specific EUROCAE Working Groups, for example, WG-105

UAS work programme and European UAS Standards Coordination Group (EUSCG). The activities of other WGs which were thought to have been of interest to the audience were also described. These other activities included Vertical Take-Off and Landing (VTOL) vehicles serving urban air mobility (UAM), counter (C)-UAS and Artificial Intelligence (AI). The information was very well received and EUROCAE got very good feedback and visibility of the Chinese UAS industry.

On 24 November 2019, EUROCAE held a bilateral meeting with the International UAS Standardisation Association. The Association is one of the main contact points in China for Unmanned Aircraft Systems (UAS) standardisation and EUROCAE took advantage of this meeting to promote its UAS work programme and identify areas of common interest. During the visit to China, EUROCAE met its partner Galleon to plan and prepare EUROCAE for participation in events proposed for 2020. Main objectives were defined, and a concrete communication campaign was agreed to get the most form EUROCAE participation at those events.

On 25 November 2019, we met with BASTRI, the research and development arm of the Commercial Aircraft Corporation of China (COMAC). At the meeting, both EUROCAE and BASTRI gave presentations outlining their activities and seeking to identify common areas of interest. BASTRI indicated their interest in playing an active role in the standards development process, particularly



as they relate to SatCom and aircraft certification. The bulk of our discussions with BASTRI at this meeting were related to the multi constellation Global Navigation Satellite System (GNSS) BeiDou (also known as Compass), which is the Chinese GNSS. As a result of these interactions, COMAC BASTRI is now an active participant in the EUROCAE Working Group (WG) 62 that is developing the next update to the Dual Frequency Multi Constellation (DFMC) GNSS standards for GPS and Galileo and BeiDou.

The 9th China Aviation Industry Summit 2020, originally planned for 27-28 February, was moved to 18-19 June 2020 and held in Tianjin, China. Due to COVID-19 travel restrictions EUROCAE officers were not able to physically attend the Summit but did make a prerecorded presentation.

The EUROCAE Secretary General was invited to make a presentation to the *Civil Avionics International Forum (CAIF)*. The CAIF is a yearly International conference focusing on avionics. The event, originally planned 21-22 April, was moved to 12-13 August 2020 and took place in Shanghai. The EUROCAE Secretary General made a virtual, online presentation, focusing on the general introduction of EUROCAE and a summary of all our avionics and airborne related standardisation activities.

The 2nd International Symposium on Air Traffic Management (ATM) for Civil Aviation 2020, took place on 15-16 September 2020. EUROCAE was invited to participate and contributed via two live virtual presentations. One presentation made by EUROCAE Secretary General explained EUROCAE processes as a global Standards Developing Organisation (SDO), and briefly addressed all our ATM related activities. The Secretary General's presentation was perfectly complemented by a detailed presentation by the WG chair, presenting EUROCAE WG-81 activities on interoperability of ATM validation platforms.

In general, it is observed that China is showing more interest in European certification and standards development activities, whereas in the past they have tended to focus on US certification activities. The increase in interest is being reflected in the number and type of invitations EUROCAE is receiving from Chinese organisations. The increase in interest is also being reflected in the degree to which Chinese organisations are joining EUROCAE as member and participating in EUROCAE activities.

NATO Workshop on the use of Civil Standards

Under the overall title "Bridging Defence and Civil Standardisation, Challenges and the Way Ahead", The Hellenic National Defence General Staff organised a workshop on the "NATO Use of Civil Standards". The meeting was held in Athens from 25 to 27 February 2020. In support of the NATO Standardisation policy, this workshop provided an opportunity for the exchange of knowledge and views between 130 participants from 26 nations, including 11 Standard Developing Organisations (SDOs) and many NATO committee representatives.

The presentation of the NATO standardisation policy, and its implementation in the main Committees working on operational, technical or administrative standards confirmed the belief that adoption, of suitable non-NATO – (civil or national defence) – standards should be the rule in lieu of developing NATO standardisation documents. This "Civil as possible, Military only as necessary" approach is indeed the preferred approach for many nations.

Following an introduction by the main SDOs of their organisations and methods of work, an introduction to the NATO Aviation Committee and the American National Standards Institute (ANSI) initiative on Unmanned Aircraft System (UAS) standards coordination was made.

EASA, EUROCONTROL and EUROCAE then presented the overall approach of Performance-Based Regulation implemented in Europe, outlining the complementary roles of the 4 pillars of R&D, Standards, Regulation and Deployment. The EUROCAE presentation was an opportunity to present inputs on civil-military technical standardisation interaction, and to propose enhancing cooperation with the appropriate NATO Committees, based on existing or proposed activities.

To conclude this outstanding event, a panel discussion recommended maintaining such a forum for strengthening networking cooperation between Subject Matter Experts (SME) and to facilitate the development of shared requirements.

As a direct implication for EUROCAE, cooperation and exchange of information in the airspace domain could be formalised through the establishment of a Technical Cooperation Agreement (TCA) with the NATO Standardisation Management Group (SMG). The Counter UAS topic addressed in a NATO Working Group (WG) and in EUROCAE WG-115, now working jointly with RTCA SC-238, is a perfect example where harmonised development of standards could be beneficial.



Stakeholder engagement: Canada

While in Canada to attend the 40th ICAO General Assembly in Montreal EUROCAE Secretary General Christian Schleifer met with EUROCAE members and partners in Canada. This included meetings with the following organisations:

▶ NAV CANADA head office Ottawa:

NAV CANADA is the Canadian Air Navigation Service Provider (ANSP). NAV Canada is a very active member of EUROCAE, participating in several Working Groups. By presenting EUROCAE's current and future work programme we have identified additional areas of common interest where NAV Canada has expertise to assist EUROCAE and address some of their own current challenges.

▶ Searidge Technologies:

EUROCAE Secretary General met with a young and innovative Searidge team, which is developing and deploying advanced, virtual airport and tower solutions. Searidge is actively contributing to the EUROCAE standardisation activities in WG-100 remote and virtual towers and is also co-chairing WG-114 on Artificial Intelligence (AI). During our

meeting we also identified several new areas on which we will collaborate much more closely in the near future.

▶ Transportation Safety Board (TSB) of Canada:

Triggered by a recommendation issued for a EUROCAE standard and the annual assessment done by the TSB, EUROCAE Secretary General met with the TSB Director of Investigations/Air and delivered in person our answers to the safety recommendation. The investigation has provided EUROCAE with substantial input to update and revise our standard. We were also pleased to note that TSB's most urgent aviation safety targets and initiatives matched nearly 100% the activity EUROCAE is currently conducting or has already addressed in its strategic outlook, the Technical Work Programme. EUROCAE and TSB agreed to look into a closer collaboration between the two organisations.



EUROCAE publications

EUROCAE Documents (ED) are developed by Working Groups bringing together renowned experts in their area, and following a well-established process

EUROCAE has published more than two hundred documents in support of the aviation community, several of them developed jointly with US partners and many referenced in ETSO/TSOs and/or referred to in ICAO SARPs, EASA, EUROCONTROL or FAA provisions. They are recognised worldwide for their high quality and as state of the art technical specifications.

These EDs cover system or equipment performance standards, 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.

EUROCAE Reports (ER) describe results of Working Groups, which are of general interest but not appropriate to publish in the form of a specification or other type of ED.

All full members are entitled to consult our whole catalog for free. EDs are available for download via our e-shop at the following address:

<https://eshop.eurocae.net>

Other members and non-members may buy EUROCAE Documents from our eShop:

www.eurocae.net/eshop/catalog

NEW EDs PUBLISHED DURING THE PERIOD MAY 2019 TO OCTOBER 2020 ARE MARKED WITH THIS SIGN: ★

1/WG7/70	MPS for airborne 75 MHz marker beacon receiving equipment	WG-7
1/WG7C/1-74	MPS for airborne Doppler radar ground speed and/or drift angle measuring equipment	WG-7
1/WG7C/2-74	MPS for airborne automatic dead reckoning computer equipment utilising aircraft heading and Doppler obtained velocity vector data	WG-7
ED-14G	Environmental Conditions and Test procedures for airborne equipment	WG-14
ED-14G Change 1	Environmental Conditions and Test procedures for airborne equipment	WG-14
ED-12C	Software considerations in airborne systems and equipment certification ▶ Including Amendment N°1 – 19 October 1999	WG-71
ED-18	Audio systems characteristics and MPS aircraft microphones (except carbon), aircraft headsets, handsets and loudspeakers, aircraft audio selector panels and amplifiers	WG-18
ED-22	MPS for airborne VOR receiving equipment	WG-7
ED-22A	MPS for airborne VOR receiving equipment	WG-7
ED-22B	MPS for airborne VOR receiving equipment	WG-7
ED-23B	MOPS for airborne VHF Receiver-Transmitter operating in the frequency range 117.975 – 136.975 MHz	WG-7
ED-23C	MOPS for airborne VHF Receiver-Transmitter operating in the frequency range 117.975 – 137.000 MHz	TF-Cli-max

ED-24	MPS for airborne VHF communications equipment operating in the frequency range 118.000 – 135.975 MHz (Part 2 - transmitter)	WG-7
ED-25	Performance Specification for experimental aerosat L-BAND avionics	WG-15
ED-26	MPS for airborne altitude measurements and coding systems	WG-9
ED-27	MOPR for airborne area navigation systems based on VOR and DME as sensors	WG-13
ED-28	MPS for airborne area navigation computing equipment based on VOR and DME as sensors	WG-13
ED-29	MPS for airborne omega navigation equipment	WG-16
ED-30	MPS for airborne low range radio (radar) altimeter equipment	WG-6
ED-31	MPS for ground distance-measuring equipment (DME)	WG-17
ED-36	MOPS for Microwave Landing System (MLS) (Airborne Receiving Equipment)	WG-19
ED-36B	MOPS for MLS Airborne Receiving Equipment	WG-28
ED-38	MPS for airborne weather ground mapping and assisted approach pulse radars	WG-3
ED-39	MOPR for airborne area navigation systems, based on two DME as sensors	WG-13
ED-40	MPS for airborne computing equipment for area navigation system using two DME as sensors	WG-13
ED-41	MPS for airborne fuel quantity gauging systems	WG-22
ED-42	MPS for a fuel flowmeter to aircraft standards	WG-22
ED-43	MOPR for the SSR transponder and the altitude measurement and coding systems	WG-9
ED-46B	MOPS for airborne ILS localizer receiving equipment ▶ Including Amendment N°1 – October 1995 & Amendment N°2 – July 1997	WG-43
ED-47B	MOPS for airborne ILS glide path receiving equipment ▶ Including Amendment N°1 – 15 July 1997	WG-43
ED-51	MPS for airborne automatic direction finding equipment ▶ Including Amendment N°1 – October 1987	WG-7
ED-52	MPS for conventional and Doppler VHF omnirange (C VOR and D VOR) (ground equipment) ▶ Including Amendment N°1	WG-23
ED-53A	MOPS for microwave landing system (MLS) (ground equipment) ▶ Including Amendment N°1 – August 1994	WG-32
ED-54	MOPR for distance measuring equipment interrogators (DME/N and DME/P) operating within the radio frequency range 960 – 1215 MHz (airborne equipment)	WG-25
ED-55	MOPS for flight data recorder systems	WG-21
ED-56A	MOPS for cockpit voice recorder system	WG-18
ED-57	MPS for distance measuring equipment (DME/N and DME/P) (ground equipment) ▶ Including Amendment N°1 – 26 October 1992	WG-25
ED-58	MOPS for area navigation equipment using multi-sensor inputs (airborne equipment)	WG-13

ED-62B	MOPS for Aircraft Emergency Locator Transmitters 406 MHz		WG-98
ED-62B Change 1	MOPS for Aircraft Emergency Locator Transmitters 406 MHz - Change 1	★	WG-98
ED-64	Changes to be applied to FAA Advisory Circular No. 25-11 "Transport category airplane electronic display systems" for adoption as JAR AC		WG-24
ED-65	MOPS for passenger protective breathing equipment		WG-36
ED-67	MOPS for devices that prevent unintentional or continuous transmissions		WG-38
ED-68	MOPS for devices that prevent simultaneous transmissions		WG-38
ED-69	MOPS for wheels and brakes on JAR part 25 civile aeroplanes		WG-40
ED-73E	MOPS for SSR Mode S Transponders		WG-49
ED-74	MOPS for combined ILS and MLS airborne receiving equipment ▶ Including Amendment N°1 - 15 July 1997		WG-13
ED-75D	MASPS Required Navigation Performance for Area Navigation		WG-85
ED-76A	Standards for Processing Aeronautical Data		WG-44
ED-78A	Guidelines for Approval of the Provision and Use of Air Traffic Services supported by Data Communications		WG-53
ED-79A	Guidelines for Development of Civil Aircraft and Systems		WG-63
ED-80	Design assurance guidance for airborne electronic hardware		WG-46
ED-81	Certification of aircraft electrical/electronic systems for the indirect effects of lightning ▶ Including Amendment N°1 - 26 August 1999		WG-31
ED-82A	MOPS for Mode S aircraft data link processors		WG-49
ED-83	Recommendations on ground collision avoidance systems		WG-44
ED-84A	Aircraft Lightning Environment and Related Waveforms		WG-31
ED-85A	Data-Link application system document (DLASD) for the "Departure Clearance" Data-Link service		WG-45
ED-86	Equipment characteristic for Mode S transponders with extended interface functions (mark 4 transponder)		WG-49
ED-87D	MASPS for A-SMGCS including new Airport safety Support Service Routing Service and Guidance Service	★	WG-41
ED-88	MOPS for multi-mode airborne receiver (MMR) including ILS, MLS and GPS used for supplemental means of navigation		WG-43
ED-89A	Data-Link application system document (DLASD) for the "ATIS" Data-Link service		WG-45
ED-91A	Lightning Zoning		WG-31
ED-92C	Minimum Operational Performance Standard (MOPS) for an Airborne VDL Mode-2 System Operating in the Frequency Range 118-136.975 MHz		WG-92
ED-93	MASPS for CNS/ATM message recording systems ▶ Including Amendment N°1 - 23 November 1998		WG-50
ED-94C	Supporting Information for ED-12C and ED-109A		WG-71
ED-96	Requirements specification for an avionics computer resource (ACR)		WG-48

ED-98C	User Requirements for Terrain and Obstacle Data		WG-44
ED-99D	User Requirements for Aerodrome Mapping Information		WG-44
ED-100A	Interoperability Requirements for ATS Applications using Arinc 622 Data Communications		WG-53
ED-102A	MOPS for 1090 MHz Extended Squitter Automatic Dependant Surveillance - Broadcast (ADS-B) & Traffic Information Services - Broadcast (TIS-B)		WG-51
ED-102A Corrigendum 1	MOPS for 1090 MHz Extended Squitter Automatic Dependant Surveillance		WG-51
ED-103A	MOPS for Inflight Icing Detection Systems		WG-95
ED-104A	MOPS for ground ice detection systems		WG-54
ED-106A	Data-Link application system document (DLASD) for the "Oceanic Clearance" Data-Link service		WG-45
ED-107A	Guide to certification of Aircraft in a High Intensity Radiated Field (HIRF) Environment		WG-31
ED-108A	MOPS for VDL Mode 4 Aircraft Transceiver		WG-51
ED-109A	Guidelines for CNS/ATM Systems Software Integrity Assurance		WG-71
ED-110B Change 1	Interoperability Requirements Standard for Aeronautical Telecommunication Network Baseline 1		WG-78
ED-111	Functional specifications for CNS/ATM Recording		WG-50
ED-112A	MOPS for Crash Protected Airborne Recorder Systems		WG-90
ED-113	Aircraft lightning direct effects certification		WG-31
ED-114A Change 1	MOPS For Global Navigation Satellite Ground Based Augmentation System Ground Equipment To Support Category I Operations		WG-28
ED-114B	MOPS For Global Navigation Satellite Ground Based Augmentation System Ground Equipment To Support Precision Approach and Landing	★	WG-28
ED-115	MOPS for light aviation secondary surveillance radar transponders		WG-49
ED-116	MOPS for surface movement radar sensor systems for use in advanced surface movement guidance and control systems (A-SMGCS)		WG-41
ED-117A	MOPS for Mode S Multilateration Systems for Use in Advanced Surface Movement Guidance and Control Systems (A-SMGCS)		WG-41
ED-119C	Interchange Standards for Terrain, Obstacle and Aerodrome Mapping Data		WG-44
ED-120 Change 3	Safety and Performance Standard for Air Traffic Data Link Services in Continental Airspace Change 3	★	WG-78
ED-121	MOPS for Trolleys, Containers and Associated Equipment Components		WG-65
ED-122 Change 1	Safety and Performance Requirements (SPR) for ATS Oceanic		WG-78
ED-123	MOPS for Flight Deck Door Monitoring System		WG-66
ED-124	Integrated Modular Avionics (IMA) Development, Guidance and Certification Consideration		WG-60
ED-125	Process for Specifying Risk Classification Scheme and Deriving Safety Objectives in ATM		WG-64
ED-126	SPR/Interop document for NRA ADS-B application		WG-51

ED-128	Guidelines for Surveillance Data Fusion in Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Levels 1 and 2	WG-41
ED-129B	Technical Specification for a 1090 MHz extended Squitter ADS-B ground station	WG-51
ED-130A Change 1	Guidance for the Use of Portable Electronics Devices (PEDs) On Board Aircraft - Change 1	WG-99
ED-132	ATC System Architecture Model Specification	WG-61
ED-133	Flight Object Interoperability Specifications (FOIS)	WG-59
ED-136	VoIP ATM System Operational and Technical Requirements	WG-67
ED-137/1B	Interoperability Standards for VoIP ATM components - Volume 1: Radio	WG-67
ED-137/2B	Interoperability Standards for VoIP ATM components - Volume 2: Telephone	WG-67
ED-137/3B	Interoperability Standards for VoIP ATM components - Volume 3: European Legacy Telephone Interworking	WG-67
ED-137/4B	Interoperability Standards for VoIP ATM components - Volume 4: Recording	WG-67
ED-137/5B	Interoperability Standards for VoIP ATM components - Volume 5: Supervision	WG-67
ED-137A	Interoperability Standards for VoIP ATM Components	WG-67
ED-137C/1	Interoperability Standard for VOIP ATM Components - Volume 1: Radio	WG-67
ED-137C/1 Change 1	Interoperability Standard for VOIP ATM Components - Volume 1 Radio - Change 1	★ WG-67
ED-137C/2	Interoperability Standard for VOIP ATM Components - Volume 2 Telephone	WG-67
ED-137C/2 Change 1	Interoperability Standard for VOIP ATM Components - Volume 2 Telephone - Change 1	★ WG-67
ED-137C/2-1	Interoperability Standard for VOIP ATM Components - Volume 2 Telephone - Addendum 1	WG-67
ED-137C/2-2	Interoperability Standard for VOIP ATM Components - Volume 2 Telephone - Addendum 2	WG-67
ED-137C/2-3	Interoperability Standard for VOIP ATM Components - Volume 2 Telephone - Addendum 3	WG-67
ED-137C/2-4	Interoperability Standard for VOIP ATM Components - Volume 2 Telephone - Addendum 4	WG-67
ED-137C/2-5	Interoperability Standard for VOIP ATM Components - Volume 2 Telephone - Addendum 5	WG-67
ED-137C/2-6	Interoperability Standard for VOIP ATM Components - Volume 2 Telephone - Addendum 6	WG-67
ED-137C/2-7	Interoperability Standard for VOIP ATM Components - Volume 2 Telephone - Addendum 7	WG-67
ED-137C/2-8	Interoperability Standard for VOIP ATM Components - Volume 2 Telephone - Addendum 8	WG-67
ED-137C/4	Interoperability Standard for VOIP ATM Components - Volume 4: Recording	WG-67
ED-137C/4 Change 1	Interoperability Standard for VOIP ATM Components - Volume 4 Recording - Change 1	★ WG-67
ED-137C/5	Interoperability Standard for VOIP ATM Components - Volume 5 Supervision	WG-67
ED-138 Part 1	Network requirements and performances for voice over internet protokol (VOIP) air traffic managemen	WG-67

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ED-142	Technical Specification for Wide Area Multilateration (WAM) Systems	WG-70
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ED-145	Airport CDM Interface Specification	WG-69
ED-147A	ATM Validation Platforms Interoperability Specification	WG-81
ED-148	Guidance to Achieve ATM Validation Platforms Interoperability	WG-81
ED-151	Operational Services and Environment Definition (OSED) for Aeronautical Information Services (AIS) and Meteorological (MET) Data Link Services	WG-76
ED-152	Aircraft Precipitation Static Certification	WG-31
ED-153	Guidelines for ANS Software Safety Assurance	WG-64
ED-154A	Future Air Navigation System 1/A – Aeronautical Telecommunication Network Interoperability Standard (FANS 1/A – ATN B1 Interop Standard)	WG-78
ED-155	MOPS Lightweight Flight Recording Systems	WG-77
ED-156A	ADS-B Application Interoperability Requirements for VDL Mode 4	WG-51
ED-158	User Manual for certification of aircraft Electrical and Electronic systems for the indirect effects of lightning	★ WG-31
ED-159	Safety, Performance and Interoperability Requirements Document for AT-SA-ITP Application	WG-51
ED-160	Safety, Performance and Interoperability Requirements Document for Enhanced Visual Separation on Approach (ATSA-VSA)	WG-51
ED-161	Safety, Performance and Interoperability Requirements Document for ADS-B-RAD Application	WG-51
ED-163	SPR and Interop for ATSA ADS-B-APT	WG-51
ED-164	Safety, Performance and Interoperability Requirements Document for Enhanced Traffic Situational Awareness During Flight Operations (ATSA-AIRB)	WG-51
ED-165	ATSA SURF SPR and Interop	WG-51
ED-175	SPR and Interop for aeronautical information and meteorological data link services	WG-76
ED-179B	MASPS for enhanced vision systems synthetic vision systems combined vision systems and enhanced flight vision systems	WG-79
ED-181	Guidance for the Development of Airborne Collision Avoidance Systems	WG-79
ED-194A	Automatic Dependent Surveillance – ADS-B	WG-51
ED-194A Change 1	Minimum Operational Performance Standards (MOPS) for Aircraft Surveillance Applications (ASA) System	WG-51 SG-3
ED-194A Change 2	Minimum Operational Performance Standards (MOPS) for Aircraft Surveillance Applications (ASA) System - Change 2	WG-51 SG-3

ED-194B	Minimum Operational Performance Standards (MOPS) for Aircraft Surveillance Applications (ASA) System		WG-51 SG-3
ED-195A	Safety, Performance and Interoperability Requirements Document for Aircraft Spacing Flight-deck Interval Management (ASPA-FIM)		WG-51
ED-195B	Safety and Performance and Interoperability Requirements Document for Airborne Spacing Flight-deck Interval Management (ASPA-FIM)		WG-51 SG-3
ED-200A	"Surface Movement Guidance and Control Systems Report of EUROCAE WG-41; Vol I + Vol II"		WG-41
ED-201	AISS Framework Guidance Document		WG-72
ED-202A	Airworthiness Security Process Specification		WG-72
ED-203A	Airworthiness Security Methods and Considerations		WG-72 SG-1
ED-204	Information Security Guidance for Continuing Airworthiness		WG-72
ED-205	Process Standard for Security Certification and Declaration of ATM ANS Ground Systems	★	WG-72 SG-2
ED-215	Software tool qualification considerations		WG-71
ED-216	Formal methods supplement to ED-12C and ED-109A		WG-71
ED-217	Object-oriented technology supplement to ED-12C and ED-109A		WG-71
ED-218	Model-based development and verification supplement to ED-12C and ED-109A	★	WG-71
ED-219	Aircraft Fuel Cell Safety Guidelines		WG-80
ED-220	Guidelines for the Verification and Validation of AMDB ASRN for routing applications		WG-44
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ED-222	Technical Specification: Aeronautical Mobile Airport Communications System (AeroMACS) Profile		WG-82
ED-223	MOPS for the Aeronautical Mobile Airport Communication System (AeroMACS)		WG-82
ED-224	MASPS for Automatic Flight Guidance and Control System coupled to TCAS		WG-75
ED-225	Ice and Rain Minimum Qualification Standards for Pitot and Pitot-Static Probes		WG-89
ED-227	MASPS for AeroMACS		WG-82
ED-228A	Safety and Performance Standard for Advanced ATS Data Communication		WG-78
ED-229A	Interoperability Standard for Data Communication via ATN		WG-78
ED-230A	Interoperability Standard for Data Communication via a Mix of ATN and FANS-1 A		WG-78
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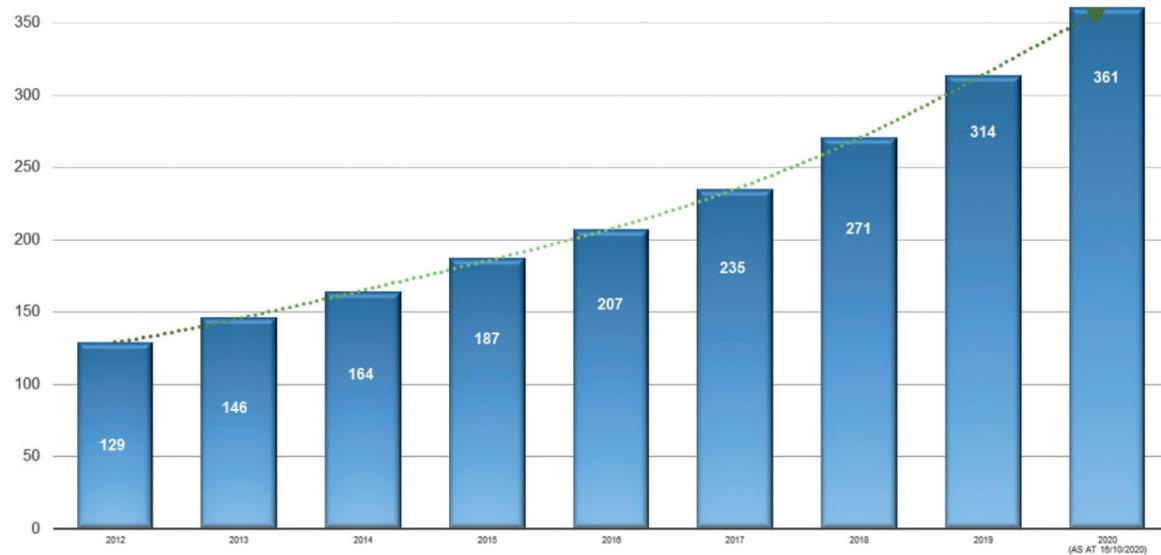
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