A year has now gone by since I took over the reins at RTCA. At the time of my arrival, it was clear that RTCA was at a crossroads that would determine its future. The first order of business was the development of a 5-year strategic plan for our organization. This laid the framework and now serves as an important guide for our governing bodies, the RTCA staff, our members, and other stakeholders that is positioning us for success in an ever-changing global aviation environment.

continued on page 2
Our efforts in 2019 were built around our three core strategic pillars: stakeholder success, enduring financial strength, and authentic thought leadership. We focused on enhancing our value and relevancy for the aviation industry. We developed sound practices to support a disciplined business structure. We leveraged our expertise for the purpose of educating, improving, and adding value to the broader aviation industry.

2019 was a year of transition for RTCA. As we move into 2020, I’m pleased that our core business of standards development remains robust, we have a sound financial position, and our government/industry relationships are strong. Today we are well positioned for the future to face challenges, enhance success for our stakeholders, and discover opportunities for growth in our business and membership base.

RTCA President and CEO, Terry McVenes and VP, Aviation Technology and Standards, Al Secen represented RTCA at the 2019 EIWAC in Tokyo, Japan in October.
RTCA has teamed with MANNARINO Systems & Software Inc. to offer four new technical seminars expanding the suite of training programs that RTCA provides for the aviation industry. The seminars will offer aviation industry participants proficient domain knowledge on topics relevant to current challenges in aircraft systems, software and electronic hardware development.

Management Seminar: DO-178B/C, DO-254 & SAE/ARP4754A
The training material provides a management-level overview of RTCA/DO-178B & C, RTCA/DO-254 & SAE/ARP4754A objectives and associated activities required as part of a certification program. It provides insight on the usual certification pitfalls, processes flaws, project cost, recommended practices and maintainability aspects of these programs. Created for aerospace industry management personnel, this seminar focuses on the most common challenges for development, verification and certification of safety critical equipment.

January 28, 2020

Guidelines for Development of Civil Aircraft and Systems
RTCA has teamed with MANNARINO Systems & Software Inc. to offer high quality and relevant training for the aviation industry in understanding the development assurance industry guidance material for aircraft and systems. MANNARINO uses their industry experience and technical expertise to provide training on the standard and recommended practices proposed by the SAE ARP4754A document.

This course covers in detail, industry guidance for the development of aircraft and aircraft systems and how this guidance is deployed in industry in terms of practical application within a company's engineering processes and demonstration of compliance to ARP4754A objectives. The training provides a detailed review of the guidelines for System Development Assurance, applicable to commercial aircrafts and systems. It provides detailed guidance on which processes are required to develop and verify aircraft and systems, as well how these processes are tailored to the different aircraft systems and Functional Design Assurance Levels (FDAL), and it provides recommendations on the level of validation and verification rigor to be applied for each aircraft and system function based on FDAL. It provides in-class workshops with examples of the application of the guidance material for system & safety aspects.

March 17-19, 2020

Guidance for Engineers: DO-178C DAL D Systems
This training provides a thorough review of the RTCA/DO-178C objectives necessary to achieve compliance for airborne software components assigned DAL D. This condensed version of DO-178C training will present what is needed for an organization to put together the minimum plans, processes and data required to demonstrate compliance to DAL D objectives. In-class workshops will consolidate the learning by providing practical examples of requirements capturing, hardware/software integration tests and problem reports.

May 6-7, 2020

Integrated Modular Avionics (IMA) Development Guidance and Certification Considerations
Coming Soon
A WORD FROM TOM PAGANO, CHAIRMAN OF SC-209 AND LEADER OF COMBINED SURVEILLANCE COMMITTEE

The Combined Surveillance Committee (CSC) has been actively developing updates to the Mode S Transponder and 1090 MHz Extended Squitter Automatic Dependent Surveillance – Broadcast (ADS-B) and Traffic Information Services – Broadcast (TIS-B) MOPS documents over the last several years. The CSC met for the first time in February 2016 and has been actively meeting and working towards delivering updated MOPS to RTCA in time for the RTCA Program Management Committee (PMC) meeting in September 2020. The final meeting of the CSC is scheduled for June 2020 at EASA Headquarters in Cologne, Germany. The CSC is a composite of four separate entities that includes SC-186 ADS-B Working Group (WG) 3, SC-209 ATCRBS/Mode S Transponder and EUROCAE WG 49 Mode S Transponders and WG 51 ADS-B. The harmonization of the Mode S Transponder and 1090 MHz Extended Squitter (1090ES) MOPS changes between RTCA and EUROCAE is of paramount importance to the international aviation community. Ultimately, the changes that result from the work of the CSC will be reflected in international standards at ICAO. One significant benefit that will result from the updates to the Mode S Transponder MOPS is cost savings potentially realized by eliminating legacy functions no longer utilized. The CSC is coordinating with other RTCA committees to incorporate required capabilities. The CSC is working with SC-206 Aeronautical Information and Meteorological Data Link Services to support broadcast of meteorological data via ADS-B and SC-147 Traffic Alert & Collision Avoidance System to support ACAS X and future collision avoidance coordination capabilities. One of the important drivers in updating the 1090ES MOPS is to support the Advanced Interval Management application in development by SC-186 WG 4. The update to the 1090ES MOPS will provide support for reporting of supersonic and commercial space vehicles as well as the introduction of the capability to overlay phase-modulated data over existing 1090ES signals. This capability is being introduced as optional in this version of the MOPS but is expected to be the means of providing future capacity over the crowded 1090 MHz frequency as it is designed to increase capacity without adding additional signals or impacting congestion.

FORUM FOR AERONAUTICAL SOFTWARE (FAS)

The Forum for Aeronautical Software (FAS), a joint group sponsored by both RTCA and EUROCAE, met in person in November and was hosted by EASA in Cologne, Germany. Earlier this year, the FAS produced a white paper for the Program Management Committee (PMC) which addressed considerations on using DO-178C/ED-12C in UAS software development. During the meeting, the group reviewed and edited FAS Topic Papers which will be published in early 2020 to clarify some of the questions raised by the UAS community about using DO-178C/ED-12C for their development process. RTCA is in the process of considering the option of forming a new Special Committee, to function jointly with a EUROCAE working group, to address the remaining recommendations from the white paper to complete the clarifications needed for RTCA/EUROCAE standards to address the continuum of requirements across all software for aviation. The FAS was established after the publication of DO-178C/ED-12C to maintain a group of experts who could answer questions about the software development process documents.

FAS Members at their Meeting in Cologne, Germany
RTCA has teamed with Wichita State University’s National Institute for Aviation Research (WSU-NIAR) to offer another high quality training course covering the RTCA Security Suite: DO-326A, Airworthiness Security Process Specification; DO-355, Information Security Guidance for Continuing Airworthiness; and DO-356A, Airworthiness Security Methods and Considerations. This course describes what Airworthiness Security is and why it is important. It also explains which FAA Regulations, standards, etc. will require these documents and procedures as well as how to use these standards. The course will also cover what the standards are meant to prevent and how these standards and processes fit into the aviation system.

Security Airworthiness Certification Training Course

JANUARY 13-15, 2020
MAY 12-14, 2020
OCTOBER 20-22, 2020

For additional questions email training@rtca.org
ENHANCED FLIGHT VISION SYSTEMS AND SYNTHETIC VISION SYSTEMS (EFVS/SVS)


EUROCAE WG-79 is working on a Combined Vision Systems (CVS) for Rotorcraft for Operational Credit. The Committee will ask the Program Management Committee (PMC) to add this new document to its Terms of Reference (TOR) at their December Meeting.

SC-213 all smiles during their meeting in Washington, DC

AERONAUTICAL MOBILE-SATELLITE (R) SERVICE

AERONAUTICAL SYSTEMS SECURITY


AIRPORT SECURITY ACCESS CONTROL SYSTEMS

SC-224 met November 21st at RTCA to begin work on DO-230K, Standards for Airport Security Access Control System. This next version will include updates to the credentialing, integration, procurement, and biometrics sections. Additionally, new sections on facilitation and cybersecurity will be added. This document is currently scheduled to be presented to the Program Management Committee (PMC) for publication in late-2021.
Season’s Greetings
FROM THE
RTCA STAFF
If you need better answers to these and other questions, join the graduates who have benefited from our course. Register early to guarantee your seat.

Do you know how the Software Life Cycle at your organization relates to the Software Development Process that supports producing software which can approved?

Is your System Process supporting your Software Development Cycle to ease implementation of the aspects of certification for software?

Can you explain how what you do in your software process relates to a certification process?

Three days of instruction focused on the details of DO-178C

Registration discount for RTCA members

Online registration on RTCA’s DO-178C Training site

Next Class: April 27-29, 2020

Classes start at 8:00am and end at 5pm each day.

Questions? Contact training@rtca.org

RTCA | 1150 18th Street NW, Suite 475, Washington, DC 20036

ENVIRONMENTAL TESTING

SC-135 met in Salem, Oregon in October and was hosted by Garmin. The Committee held three days of Working Group (WG) meetings before holding their Plenary on the final day. The Ground Station Environment WG completed reviewing all comments against the new standard for environmental tests for ground stations. During plenary, the committee approved initiating Final Review and Comment (FRAC) on this document. The review period began in December 2019 and will close in January 2020. All comments will be dispositioned at the next plenary in February. Publication is expected in June of next year.

The group also continued their work reviewing the change proposals that have been raised against DO-160G/ED-12G. All change proposals are coordinated with EUROCAE WG - 14 to maintain DO-160() and ED-12() as technically equivalent documents.
Aeronautical Data

DO-358A, Minimum Operational Performance Standards (MOPS) for Flight Information Services - Broadcast (FIS-B) with Universal Access Transceiver (UAT)

Issued 06-27-2019 | Prepared by SC-159

This document contains Minimum Operational Performance Standards for Flight Information Services Broadcast System (FIS-B) with Universal Access Transceiver (UAT). These standards specify system characteristics that should be useful to designers, manufacturers, installers and users of the equipment. This document considers an equipment configuration consisting of the airborne processing and cockpit display of aeronautical and meteorological data known as FIS-B provided by the Federal Aviation Administration (FAA). Functions or components that refer to equipment capabilities that exceed the stated minimum requirements are identified as optional features. This document supersedes DO-358.

The data “Supplement to DO-358A” is a zip file archive that contains test group files described in Section 2.4. The archive includes 24 sets of test group zip files. Each test group zip file includes a test procedures document, test stimulus timing information, and binary data input files for conducting the tests. This supplement is available only by electronic download.

DO-358A, Supplement

Issued 06-27-2019 | Prepared by SC-159

The data “Supplement to DO-358A” is a zip file archive that contains test group files described in Section 2.4 of DO-358A, Minimum Operational Performance Standards for Flight Information Services Broadcast System (FIS-B) with Universal Access Transceiver (UAT). The archive includes 24 sets of test group zip.

DO-343B, Minimum Aviation System Performance Standard for AMS(R)S Data and Voice Communications Supporting Required Communications Performance (RCP) and Required Surveillance Performance (RSP)

Issued 4-1-2019 | Prepared by SC-222

Description This document contains Minimum Aviation System Performance Standards (MASPS) for Aeronautic Mobile Satellite (Route) Services (AMS(R)S) that provide safety communications to aircraft in airspace where 1) procedural separation is applied or 2) ATS surveillance services are provided. The performance defined in this document is intended to provide (1) data communication services that comply to the RCP130, RCP240, RCP400/ A1 or RCP400/A2 standards of Required Communications Performance (RCP) for two-way, bidirectional, Controller Pilot Data Link Communications (CPDLC) and to the RSP160, RSP180 or RSP400 standards of Required Surveillance Performance (RSP) for one-way aircraft-to-Air Navigation Service Provider surveillance-related information, and (2) voice communication services that comply to the RCP400/V standard for two-way, bidirectional voice communications between pilots and controllers and to the RSP400/V standards for one-way voice communications between pilots and controllers. The document contains includes Technique Specific Normative Appendices for INMARSAT and Iridium. The new revision also contains more explicit language on data security.

DO-262D, Minimum Operational Performance Standards for Avionics Supporting Next Generation Satellite Systems (NGSS)

Issued 4-1-2019 | Prepared by SC-222

Description This document contains minimum operational performance standards (MOPS) for avionics that provide Aeronautical Mobile Satellite (R) Services (AMS(R)S) by means of satellite communications technologies scheduled to become operational in context of the global and regional ATM and CNS modernization (e.g. ICAO/Global Air Navigation Plan, Europe/SESAR, US/NextGen). Each of these technologies is individually and collectively referred to as a "Next Generation
Satellite System" (NGSS), and the NGSS nomenclature will be used throughout this document. This release is a joint RTCA/EUROCAE document and includes Technique Specific Normative Appendices for INMARSAT Swift Broadband and Iridium Block 1. The new revision also contains more explicit language on data security.

Air Traffic Data Communication Services

DO-290 Change 3, Safety and Performance Requirements Standard for Air Traffic Data Link Services in Continental Airspace (Continental SPR Standard)

Issued 09-24-2019 | Prepared by SC-214

Change 3 to DO-290/ED-120 is to remove any reference to DM89 MONITORING message element as being required to support any datalink operations. This approach makes DO-290/ED-120 consistent with actual datalink procedures, in line with the approach already agreed by EUROCAE/RTCA subject matter experts when Baseline 2 Datalink standards were developed.

This change allows both existing ATN B1 interoperability standards (DO-280B/ED-110B) and B2 interoperability standards (DO-353A/ED-231A) being recognized as acceptable means of compliance with DO-290/ED-120.

Automatic Dependent Surveillance-Broadcast (ADS-B)

DO-317B, Change 1 to Appendix U

Issued 4-10-2019 | Prepared by SC-186

This document is Change 1 for DO-317B and is an Appendix (U) that describes specific aircraft track sets that are used to provide stimulus scenarios for TSAA testing. The tracks are split into two categories: 1) Must Alert and 2) Must Not Alert. Must Alert tracks test the alerting capabilities of a TSAA system for a range of aircraft encounters that have historically occurred in both airport and en route environments. Must Not Alert tracks test similar encounters as the Must Alert tracks except that the closest point of approach is modified to separate aircraft such that no alerting should occur according to pilot and industry experts. Each track set contains multiple scenarios that test a range of track data sources as well as track state variables. GNSS – specifications and RLS

Communications

DO-378, Minimum Aviation System Performance Standard (MASPS) for Coexistence of Wireless Avionics Intra-Communication Systems within 4200-4400 MHz

Issued 07-01-2019 | Prepared by SC-236

EUROCAE and RTCA have defined this Minimum Aviation System Performance Standard (MASPS) that applies to Wireless Avionics Intra-Communications (WAIC) systems utilizing the frequency band 4200 – 4400 MHz as allocated by the World Radiocommunication Conference (WRC) in 2015. Key criteria for allocation of the band by the WRC were (i) coexistence between WAIC systems and (ii) coexistence between WAIC systems and Radio Altimeters (RA), both on board neighboring aircraft.

This MASPS defines two Performance Requirements (PR) that ensure WAIC systems meet the above coexistence criteria. The first PR specifies the aggregate power spectral flux density allowed to be emitted by WAIC systems on board an aircraft. The second PR specifies tolerance of WAIC systems to Radio Frequency (RF) emissions from RA and WAIC systems from neighboring aircraft. Both PRs were derived after significant work by the Aerospace Vehicle Systems Institute (AVSI), EUROCAE and RTCA organizations to understand and characterize the worst-case conditions that may be experienced during the normal course of operation of the worldwide aircraft fleet.

This MASPS then specifies metrics to verify the aggregate power spectral flux density and interference susceptibility of WAIC systems.

Finally, this MASPS provides an acceptable means to demonstrate compliance along with corresponding pass/fail criteria.
2019 DOCUMENTS

Enhanced Flight Vision Systems and Synthetic Vision Systems

DO-375, Minimum Aviation System Performance Standards (MASPS) for a Combined Vision Systems for Helicopter Operations

Issued 01-16-2019 | Prepared by SC-213

This document addresses Combined Vision Systems (CVS) technologies applied to helicopter operations. While RTCA DO-315x / EUROCAE ED-179x and DO-371 / EUROCAE ED-249 documents are not specialized for a particular type of platform or mission, they were mostly written with fixed-wing platforms and operations in mind. The present document is oriented specifically towards helicopter platforms and operations. It defines performance standards for CVS over head down and transparent displays, which intended function is to provide a supplemental view of the external scene and visual references to the pilot. Such a CVS does not provide “additional operational credit’ and is not intended to change the helicopter’s existing operational capability or certification basis. The pilot(s) is expected to follow the existing operational procedures and adhere to all published minimums. This document is technically equivalent to EUROCAE ED-255.

Global Positioning System (GPS)

DO-246E Change 1, GNSS-Based Precision Approach Local Area Augmentation System (LAAS) Signal-in Space Interface Control Document (ICD)

Issued 06-27-2019 | Prepared by SC-159

This document includes a few corrections to RTCA DO-246E. The content of the Interface Control Document (ICD) was maintained to be backward compatible with all LAAS MOPS compliant equipment specified in DO-253 as amended by applicable FAA TSOs.

This ICD defines the Signal-in-Space for the Global Navigation Satellite System (GNSS) based Local Area Augmentation System (LAAS). The LAAS has global application as a Ground-Based Augmentation System (GBAS) to GNSS. The GNSS/GBAS Signal-in-Space is composed of three signals:

1. the navigation signal transmitted from the GNSS satellites to the ground subsystem,
2. the navigation signal transmitted from the GNSS satellites to the airborne subsystem, and
3. the VHF Data Broadcast (VDB) transmitted from the GBAS ground subsystem to the airborne subsystem.

Please also purchase DO-246E for complete content.

DO-253D Change 1, Minimum Operational Performance Standards for GPS Local Area Augmentation System Airborne Equipment

Issued 06-27-2019 | Prepared by SC-159

This document is the complementary avionics standard to the International Civil Aviation Organization Annex 10 Volume I Ground Based Augmentation System standards and recommended practices (SARPs) for Ground based augment system Approach Service Types C (GAST C) and D (GAST D) as well as the differentially corrected positioning service (DCPS). Together, GAST C and GAST D support all categories of approach and landing operations with vertical and lateral guidance, as well as guided takeoff. DCPS supports horizontal positioning in local airport and terminal area environments. This change 1 of RTCA DO-253D primarily includes changes to the GBAS VHF Data Broadcast (VDB) receiver adjacent channel rejection requirements (Section 2.2.8) and the associated test procedures (Section 2.5), as well as the rationale for the VDB requirements (Appendix K) resulting from coordination of the frequency compatibility with the ICAO Navigation Systems Panel. This change 1 also includes a correction to the embedded synchronization and ambiguity resolution sequence test message (Table 2-26) contained in the VDB Training Sequence and Message Failure Rate Test (Section 2.5.2.2.5.4).

RTCA DO-253D Change 1 supersedes RTCA DO-253D.
The technical profiles section describes technical parameter selection required to meet aviation communication requirements. The objective of the parameter and specific requirement selection is to ensure deterministic behavior of IPS system and to ensure interoperability of various IPS sub-systems supporting safety of flight services. As IPS encompasses a variety of hosts and routers, a set of device classes has been defined for IPS and parameters are assigned to each device class to meet the operational uses for different environments supporting different aeronautical uses.

### Traffic Alert & Collision Avoidance System (TCAS)

**DO-385 Change 1, Minimum Operational Performance Standards for Airborne Collision Avoidance System X (ACAS X) (ACAS Xa and ACAS Xo)**

Issued 09-16-2019 | Prepared by SC-147

This document, DO-385/ED-256 Change 1, is limited to changes which correct or clarify the ACAS Xa/Xo MOPS, RTCA DO-385/ EUROCAE ED-256, Volume I. The changes embodied in this document went through the SC-147/WG-75 Change Proposal/ Change Management Process.
COMMITTEE
SC-230, Airborne Weather Detection

CO-CHAIRS
Jeff Finley, Collins Aerospace, Inc.
Dawn Gidner, Honeywell International, Inc.

NEXT MEETING
January 21-23, 2020, Virtual

SC-230 met November 12-14, hosted by University of Oklahoma, Norman, OK. They are continuing work on a feasibility study on clear air turbulence detection using Airborne LIDAR Systems with a projected completion date in early 2020. Additionally, they are working on an update to DO-220A Change 1 (MOPS for Airborne Weather Radar Systems) to add detection requirements for High Altitude Ice Water Conditions using Airborne Weather Radar Systems with a completion date in early 2021. They also had an opportunity to tour the National Weather Center and the Advanced Technology Demonstrator Facilities.

Members of SC-230 at the National Weather Center
If you want to find out more about getting your electronics hardware certified for use on aircraft, then you should attend this comprehensive RTCA training course.

If you are thinking of taking DO-254 training?

- Have you been assigned the task of preparing a PHAC without knowing what you are expected to include?
- Do you know if your project is for a simple or complex device and what it will mean to your plan for certification?
- Do you need to communicate why following DO-254 could help save your project time and money?

Next Class: April 20-22, 2020

Questions? Contact training@rtca.org

RTCA | 1150 18th Street NW, Suite 475, Washington, DC 20036

INTERNET PROTOCOL SUITE (IPS) AND AEROMACS

In October, SC-223 met jointly with EUROCAE Working Group (WG) 108 in Renton, Washington at The Boeing Company. The group is in the process of drafting, Minimum Aviation System Performance Standard (MASPS) for the IPS used in Aviation A-G Communication System. In September, the PMC approved publication of DO-379 Internet Protocol Suite Profiles which is available in the RTCA store.

At the next plenary, SC-223 and WG-108 will hold joint sessions with AEIC IPS Subcommittee to discuss the relationship among the RTCA/EUROCAE and AEIC documents.

COMMITTEE
SC-223, Internet Protocol Suite (IPS) and AeroMACS

CHAIR
Aloke Roy, Honeywell International, Inc.

NEXT MEETING
TBD

Classes start at 8am and end at 5pm each day.
RTCA DIGEST | NEW HEIGHTS REACHED, TOGETHER

Acme Aerospace
Tempe, Arizona USA

Acme Aerospace electronics and batteries power mission-critical operations for commercial, military and general aviation, as well as industrial and medical applications. Built to rigorous commercial and military requirements, Acme’s advanced power systems deliver ultra-reliable start-up, back-up and emergency power for the world’s most demanding customers, in the harshest environments and under the most hazardous conditions.

Aerion Supersonic
Reno, Nevada USA

Aerion is working to redefine air-travel starting with a supersonic business jet. Their vision is to reintroduce supersonic civil flight in an environmentally responsible manner.

Animal Dynamics Ltd
Oxford, UNITED KINGDOM

At Animal Dynamics, they know that nature’s evolved designs are more efficient, elegant and powerful than anything yet built by man. However, the last decade has seen revolutions in analytical technology that allow them to evaluate high-performance animals to a previously unachievable degree and use cutting-edge science to understand the fundamental mechanisms underlying this performance.

Animal Dynamics does not simply attempt to replicate the high-performance natural designs, but marries fine-engineering skills with a deep understanding of the fundamental mechanisms, to produce revolutionary machines that will change the shape of the future, taking inspiration from their environment in order to protect it, and capable of performance beyond anything currently found in nature or engineering.

Celasrl
Latina, ITALY

CELAB is a test laboratory specialized in testing for CE marking. It specialized in MIL-based tests, becoming the leading laboratory in military testing in Italy. The company specialized in providing the following services: laboratory tests EMC, LVD, RED, environmental qualification, mechanical simulations, evaluations as a Notified Body for the purposes of CE marking, certification of business management systems, pre-shipment inspections, second part audits, calibration of measuring instruments, training in the technical and quality sectors. The main sectors for which it operates are military, aeronautical and aerospace, automotive, railway and electromedical.

CELAB is Notified Body No. 2037 recognized by the European Union for the purposes of CE marking for the EMC Directive 2014/30 / EU (Electromagnetic Compatibility).

Griebel Aerospace Consulting
London, UNITED KINGDOM

Founded by Dr Hannes S. Griebel, Griebel Aerospace Consulting is a thought leader on advanced civil aviation operations and flight safety. Specializing in advanced concept studies, regulatory and standardization work, Griebel Aerospace Consulting also offers related product management and general business analysis services.

With aviation being part of a well-rounded portfolio of aeronautics, astronautics and project management services, Griebel Aerospace Consulting can draw on synergies between space and aviation to advise clients on future safety, operations and certification needs of manned, commercial space vehicles.

As a recognized expert on satellite-based aviation services, Dr Griebel developed innovative incident and accident prevention strategies using real-time flight data transmissions and advanced remote airspace concepts. Dr Griebel is an official advisor to air accident investigation authorities and a member of several ICAO, AEEC and RTCA working groups.

Heart Aerospace AB
Gothenburg, SWEDEN

Heart Aerospace, a Swedish start-up, is hoping to certify its first type, 19-seater ES-19, by 2025.

The company’s target for the ES-19 is to achieve 400-kilometre range, allowing for viable replacement of conventional small aircraft on regional routes. The company is subsequently planning to develop a type seating up to 48 passengers based on the same technology.

Initially, their planes will offer point-to-point transportation between Scandinavian cities, before expanding operations to the rest of the world.

Representatives of SAS Scandinavian Airlines (SK, Copenhagen Kastrup) and Wideroe (WF, Bodö) expressed general interest in the development. Heart Aerospace signed Letters of Intent with three Scandinavian carriers covering 86 aircraft.

Heart Aerospace received support from the Swedish government. Scandinavian countries are currently at the forefront of the drive to electrify aviation, with Sweden being the home of the “flygskam” or “flightshaming“ eco-awareness movement and Norway aiming to fully electrify domestic air travel by 2040.

(continued on page 17)
New Members (continued)

**Ionoscape Associates**  
Mission Viejo, California USA

Ionoscape Associates provides avionics/IFE/IFC/Satcom consulting engineering services for commercial aviation.

**KeySense Testing & Certification International Co., Ltd.**  
HuiZhou, Guangdong CHINA

KeySense Testing & Certification International Co., Ltd. is an independent third-party testing and certification agency, specialized in consulting, testing and certification of consumer electronics, rail transportation and aviation electronic products. The company has got the accreditation of CNAS and CMA, and strictly comply with the ISO/IEC 17025 and ISO 17020 quality management system. KeySense has the ability to issue impartial data independently and the testing date has high market credibility.

KeySense has been assessed and found eligible to participate in UL/TUV/ITS witness test date program. KeySense is a member of Shenzhen Research Institute of Avionics Technology (RIOA) and Shenzhen Cross-Border E-Commerce Inspection & Certification Union.

**KNSI**  
Dunmow, UNITED KINGDOM

KNSI Aviation Engineering is an EASA approved independent, comprehensive engineering organization based in Stansted Airport's Diamond Hangar providing services to airlines, MROs and aircraft owners around the world.

As an EASA Design Approval Holder (DOA), KNSI has the capability to design modifications and repairs on any small, large, wide-body or narrow body aircrafts and rotor-craft such as the De-Havilland Twin Otter DH-6, ATR-42/72, Airbus, Boeing aircrafts and many more.

**Merl, Inc.**  
Meriden, Connecticut USA

MERL, Inc. is a manufacturer of Battery Packs for emergency locator transmitters. The company also operate as an FAA certificated repair station, repairing most all makes and models of ELTs.

**Mitsubishi Research Institute, Inc. (MRI)**  
Tokyo, JAPAN

The Mitsubishi Research Institute, Inc. (MRI) is a Japanese think tank, founded in 1970 in commemoration of the centenary of the Mitsubishi Group. Their mission is to resolve societal issues both in Japan and throughout the world through their think tank, consulting, and ICT capabilities.

The company employ roughly 800 researchers with high levels of expertise in a broad range of fields, particularly in the natural sciences, and with exceptional technical and analytical abilities. They stringently maintain a neutral position which has enabled them to develop an extensive, interdisciplinary network with members of industry, academia, and government. They act as a hub connecting all sectors to overcome increasingly complex societal issues. They provide integrated solutions that encompass everything from conceptualization to realization and implementation.

**Pegasus Imagery Ltd.**  
Alberta, CANADA

Pegasus Imagery is an Alberta-based technology company that delivers real time intelligence and data solutions to Emergency Management, Public Safety and Energy sectors.

They deploy long endurance unmanned aircraft integrated with high capability sensors to provide actionable information in real-time.

Their mission is to provide actionable information to first responders and emergency managers that enable them to safeguard lives, protect infrastructure and mitigate damage to economic interests and the environment.

**Volocopter GmbH**  
Bruchsal, GERMANY

Volocopter is building the world’s first sustainable and scalable urban air mobility business to bring affordable air taxi services to megacities worldwide. With the VoloCity, the company is developing the first fully electric “eVTOL” aircraft in certification to safely and quietly transport passengers within cities. Volocopter leads and cooperates with partners in infrastructure, operations, and air traffic management to build the ecosystem necessary to ‘Bring Urban Air Mobility to Life’.

In 2011, Volocopter performed the first-ever manned flight of a purely electric multicopter and has since showcased numerous public flights with its full-scale aircraft. The most notable have been the flight at the CES 2018 in Las Vegas and the world’s first autonomous eVTOL flight in Dubai 2017.
SC-236 met in joint Plenary with EUROCAE Working Group (WG) 96 in Hamburg, Germany hosted by Lufthansa Technique. The joint group is working to create a standard to define the Minimum Operational Performance Standard (MOPS) to use WAIC in the 4200-4400 MHz band. With the completion of the Minimum Aviation System Performance Standards (MASPS) the Committee will focus on the MOPS which is expected to be referenced by the FAA and EASA to support a WAIC TSO/ETSO.

During the meeting, the group also discussed feedback they received from the ICAO Frequency Spectrum Management Panel and potential changes that should be considered for the recently published DO-378 MASPS for Coexistence of Wireless Avionics Intra-Communication within 4200-4400 MHz. The committee will ask the Program Management Committee (PMC) to add a revision of DO-378 to its current Terms of Reference (TOR) at the December 2019 meeting.
DO-178C, Software Considerations in Airborne Systems and Equipment Certification

DO-160G, Environmental Conditions and Test Procedures for Airborne Equipment

DO-330, Software Tool Qualification Considerations

DO-254, Design Assurance Guidance for Airborne Electronic Hardware

DO-365, Minimum Operational Performance Standards (MOPS) for Detect and Avoid (DAA)

For additional information and to order documents, please visit rtca.org
**TRAINING CENTER**

**DO-178C, SOFTWARE CONSIDERATIONS IN AIRBORNE SYSTEMS AND EQUIPMENT CERTIFICATION, TRAINING COURSE**

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RTCA, Inc. has teamed up with The MITRE Aviation Institute to offer high quality and relevant training for the aviation industry in understanding the requirements and parameters for avionics software development necessary to obtain FAA certification.

The two world class organizations are using their collective experience and expertise to provide training on the new standards and recommended practices contained in the DO-178C, Software Considerations in Airborne Systems and Equipment Certification.

In addition to the comprehensive course manual developed by the experts at The MITRE Aviation Institute, each training course attendee will receive the latest standards developed over a six-year period by RTCA Special Committee 205.

The course is led by instructors who will provide a thorough understanding of the requirements and the applicability of DO-178C; the fundamental techniques of software development considerations in airborne systems and equipment certification; and an introduction and overview of Software Tool Qualification Considerations, Model-Based Development and Verification Supplement to DO-178C, and Object Oriented Technology and Related Techniques Supplement to DO-178C.

**SUPPLEMENTS TO DO-178C, SOFTWARE CONSIDERATIONS IN AIRBORNE SYSTEMS AND EQUIPMENT CERTIFICATION, TRAINING COURSE**

<table>
<thead>
<tr>
<th>Month</th>
<th>Dates</th>
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<tr>
<td>April</td>
<td>30, 2020</td>
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<td>June</td>
<td>25, 2020</td>
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As an adjunct to DO-178C, this course will provide the background and scope on the four documents supporting DO-178C:

- **DO-330, Software Tool Qualification Considerations**
- **DO-331, Model-Based Development and Verification Supplement to DO-178C and DO-278A**
- **DO-332, Object-Oriented Technology and Related Techniques Supplement to DO-178C and DO-278A**
- **DO-333, Formal Methods Supplement to DO-178C and DO-278A**

Attendees will receive detailed instruction on DO-331 covering the objectives, activities, explanatory text and software life cycle data that should be applied when model-based development and verification are used as part of the software life cycle.

In addition, the training will cover the systems requirements linkage to the DO-178C and Supplement processes through an explanation of the interface to ARP 4754A, Guidelines for Development of Civil Aircraft and Systems.

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*Unless otherwise noted, all training courses will take place at RTCA Headquarters, located conveniently in downtown Washington, DC. For additional information, please visit [www.rtca.org](http://www.rtca.org) or email [training@rtca.org](mailto:training@rtca.org).
DO-254, DESIGN ASSURANCE GUIDANCE FOR AIRBORNE ELECTRONIC HARDWARE, TRAINING COURSE

April 20-22, 2020
September 22-24, 2020
December 8-10, 2020

RTCA is hosting a three-day training course, tailored specifically to design/verification engineers and project/certification managers requiring DO-254 compliance.

This three-day course will:

• Provide an overview and application of RTCA DO-254, as defined by current FAA and EASA guidance in airborne electronic systems.
• Describe how to apply the DO-254 lifecycle and supporting processes; understand system safety assessments and the design assurance level (DAL); and set up a project correctly through proper planning and standards.
• Present techniques and writing requirements for electronic hardware, and how to optimize requirements for verification processes.
• Describe how to efficiently and effectively verify requirements with simulation and hardware tests.
• Address specific considerations for programmable logic devices (PLDs) such as FPGA/ASIC versus all electronics; commercial off-the-shelf (COTS) components usage; and tool assessment and qualification.

DO-160G, ENVIRONMENTAL CONDITIONS AND TEST PROCEDURES FOR AIRBORNE EQUIPMENT, TRAINING COURSE

April 27-30, 2020 at RTCA
October 5-8, 2020 at WSU
December 14-17, 2020 at RTCA

RTCA, in partnership with Wichita State University’s National Institute for Aviation Research (WSU-NIAR), offers high quality training covering RTCA’s DO-160G, Environmental Conditions and Test Procedures for Airborne Equipment. The course will provide an understanding of the use of DO-160G and how it fits in with the greater picture of requirements, design, certification and TSOs.

Course participants will gain a clear and relevant understanding of the applicable FAA regulations, advisory material, certification procedures, design approaches/trade-offs, inspection and conformity requirements, as well as details of the necessary parts of a test plan, test report, compliance plan and compliance report. A strong focus is placed on the reduction of risk, cost and schedule throughout the design/certification process, by use of targeted design and increased first-pass success on design and testing. In addition to a comprehensive course manual, each training course attendee will receive a copy of RTCA’s DO-160G, supporting material, and will participate in real-world exercises applying the knowledge learned from the class.

*Unless otherwise noted, all training courses will take place at RTCA Headquarters, located conveniently in downtown Washington, DC. For additional information, please visit www.rtca.org or email training@rtca.org.
RTCA 2019 HIGHLIGHTS CONT’D.
RTCA CALENDAR

December

December 2-5
DO-160G Training
Hosted by RTCA
Washington, DC

December 2-4
DO-178C Training
Hosted by RTCA
Washington, DC

December 4-5
SC-231, Terrain Awareness Warning System (TAWS)
Hosted by University of Alaska
Anchorage, AK

December 5
Supplements to DO-178C Training
Hosted by RTCA
Washington, DC

December 9-12
SC-206, Aeronautical Information and Meteorological Data Link Services
Honeywell Phoenix Learning Center
Phoenix, AZ

December 9-13
SC-223, Internet Protocol Suite (IPS) and AeroMACS
Hosted by EUROCONTROL
Brussels, Belgium

December 16-17
SC-229, 406 MHz Emergency Locator Transmitters (ELTs)
Hosted by EUROCAE
St. Denis, France

December 17-19
SC-237, Helicopter Terrain Awareness System (HTAWS)
Hosted by EASA
Cologne, Germany

December 19
Program Management Committee (PMC)
Hosted by RTCA
Washington, DC

January

January 13-15
Airworthiness Security Training
Hosted by RTCA
Washington, DC

January 16
SC-224, Airport Security Access Control Systems
Hosted by RTCA
Washington, DC

January 21-23
SC-230, Airborne Weather Detection System
Hosted by RTCA
Virtual

February

February 13
SC-236, Standards for Wireless Avionics Intra-Communications System (WAIC) within 4200-4400 MHz
Hosted by AVSI
College Station, TX

February 17-20
SC-135, Environmental Testing
Hosted by NIAR
Wichita, KS

March

March 16-19
SC-216, Aeronautical System Security
Hosted by EASA
Belgium, Germany