RTCA ANNOUNCES NEW PRESIDENT AND CEO, CAPTAIN TERRY MCVENES!

Terry McVenes has a long history with aviation standards, as he has served as a member and industry co-chair of the FAA Voluntary Aviation Safety Information Sharing (VASIS) Aviation Rulemaking Committee.

McVenes comes to RTCA after spending the past decade at The Boeing Company, where he held the position of Director of System Safety and Regulatory Affairs. In this position, McVenes directed operations support to assist countries and customers with regulatory approvals to ensure efficient and effective flight operations.

His past experience also includes serving as Executive Air Safety Chairman at Air Line Pilots Association, International (ALPA), where he represented pilots on airline safety and engineering matters, including working with airlines, aircraft manufacturers, Federal
SC-147, Traffic Alert & Collision Avoidance System (TCAS) met jointly with EUROCAE Working Group (WG)75 in three virtual plenary sessions over the course of 2018, and conducted over 130 virtual and in person WG meetings. In August, the Committee closed the Final Review and Comment (FRAC) period and approved the new Airborne Collision Avoidance System (ACAS) Xa/Xo Minimum Operational Performance Standards (MOPS) document and ACAS Xa/Xo Algorithm Design Description (ADD) for referral to the Program Management Committee (PMC). On the 20th of September the PMC approved the publication of the documents as DO-385 Volume I and II.

SC-159, Navigation Equipment Using Global Navigation Satellite, celebrated their 100th Plenary in March. The group published one document DO-373, Minimum Operational Performance Standards (MOPS) for GNSS Airborne Active Antenna Equipment for the L1/E1 and L5/E5a Frequency Bands.

In March, SC-206, Aeronautical Information and Meteorological Data Link Services celebrated their 50th Plenary and rejoined Working Group (WG)76 to update DO-364, Minimum Aviation System Performance Standards (MASPS) for Aeronautical Information / Meteorological Data Link Services to incorporate more services for a global perspective. The Committee initiated Final Review and Comment (FRAC) for DO-358A, Minimum Operational Performance Standards (MOPS) for Flight Information Services Broadcast (FIS-B) with Universal Access Transceiver (UAT) with publication expected in early 2019.

SC-213, Enhanced Flight Vision Systems and Synthetic Vision Systems (EFVS/SVS) published the first SPR for visions systems in September and published the first Complete Visions Systems Minimum Aviation Systems Performance Standards (MASPS) in December. The SPR is for takeoff and landing. The CVS is for Helicopters and is not currently for operational credit. The Committee wants to build on their existing documents for EFVS/SVS/CVS to have a stable basis for operational credit during certification.
SC-216, Aeronautical Systems Security published DO-356A, Airworthiness Security Methods and Considerations. This document will serve as one of the basis for the upcoming Airworthiness Security training course RTCA is currently developing with Wichita State University’s National Institute for Aviation Research (WSU-NIAR). This course will be available in October of 2019.

SC-217, Aeronautical Databases completed the work on the User Requirements for Navigational Data to be published in early 2019. This completes their current work and they will go on hiatus for a year to awake comments.

SC-216, Aeronautical Systems Security published DO-356A, Airworthiness Security Methods and Considerations. This document will serve as one of the basis for the upcoming Airworthiness Security training course RTCA is currently developing with Wichita State University’s National Institute for Aviation Research (WSU-NIAR). This course will be available in October of 2019.

SC-217, Aeronautical Databases completed the work on the User Requirements for Navigational Data to be published in early 2019. This completes their current work and they will go on hiatus for a year to awake comments.

SC-228, Minimum Operational Performance Standards (MOPS) for Unmanned Aircraft Systems has held three Plenary sessions over the past six months and over 300 virtual Working Group (WG) meetings throughout 2018. In addition to finalizing the Phase 2 scope of work, the Committee put forth various documents for review and comment and the WG2 Minimum Aviation Systems Performance Standards (MASPS) for Final Review and Comment (FRAC).

Aviation Administration (FAA) and the National Transportation Safety Board (NTSB). He has also worked to foster international collaboration on aviation safety issues with senior levels of FAA and Transport Canada, including the FAA Administrator, FAA Associate Administrators and Transport Canada Director General.

McVenes has been an aviator with multiple type-ratings and over 17,000 flight hours over the past 30 years. He is a member of Flight Safety Foundation Board of Governors and a member of the SKYbrary Supervisory Board.

McVenes joined RTCA fulltime on December 1, 2018. He takes over from outgoing acting Executive Director Andy Cebula, and previous President Margaret Jenny.

“I am looking forward to this challenge,” said McVenes. “RTCA has an exemplary history of making aviation safer since its inception, and we have additional challenges arising every day, as our airspace and aircraft become more complex. I am also looking forward to building on past successes in international cooperation and have RTCA continue in its role as the premiere global aviation standards organization. I can’t say enough about how impressed I am with the work undertaken by our Special Committees, and RTCA staff and I am optimistic all of our members and member organizations will rise to any challenge placed before them. It is certainly an honor to be chosen to lead this organization.”

RTCA & EUROCAE HOLD ANNUAL COORDINATION SUMMIT

The leadership of RTCA and EUROCAE met at RTCA Headquarters in Washington, DC, for their annual coordination meeting November 13 and 14, 2018. During the meeting, the group reviewed the status of joint and non-joint committees, as well as actions being taken to streamline and improve standardization processes. As the two most prestigious members of the Standards Roundtable at ICAO, the group also collectively reaffirmed their joint commitment to ICAO for supplying documents to relevant ICAO member states, panels, and working groups, and discussed their recent joint paper presented to ICAO in October, on the importance of ICAO SARPS, referencing the performance standards developed by RTCA and EUROCAE.

“This meeting strengthened our partnership with EUROCAE,” said Steve Brown Chairman of RTCA. “We were able to have a strategic conversation on how the two of us could expand our work to encompass more of the international aviation community. This includes aviation manufacturers and suppliers on other continents, and shows us there's an opportunity to increasingly involve them to create more robust international relations, and determine how we might collaborate in the future.”

In addition, RTCA and EUROCAE discussed the current state of Unmanned Aerial Systems (UAS) Standards, how to coordinate the efforts to maintain consistency for global aviation of UAS and the possible development of navigational data-bases for UAS, as well as potential future joint work on cyber security and a Helicopter Terrain Awareness System.

“This face-to-face exchange of the leadership of the two organizations is fundamental to producing quality standards in a timely fashion – something our members and the aviation industry expect and deserve, said Al Secen, VP, Aviation Technology and Standards. “Our relationship with EUROCAE is very strong and we look forward to working with them well into the future in developing equivalent standards.”
RTCA announces the development of an Airworthy Security Training Course available to member organizations beginning in October 2019. The new course was developed in response to industry requests for additional security-related educational opportunities, particularly in the arena of RTCA security documents and their association with FAA certification.

To present this innovative three-day course, RTCA partnered with Wichita State University’s National Institute for Aviation Research (WSU-NIAR). In particular, this Airworthiness Security Course will examine the following RTCA security documents: DO-326A, Airworthiness Security Process Specification, DO-355, Information Security Guidance for Continuing Airworthiness, and DO-356A, Airworthiness Security Methods and Considerations. It will cover the content and practical application of these three documents, as well as the relationship between the documents, their combined use and key differences between revisions of documents, in particular, updates to DO-356A.

For additional information email training@rtca.org
RTCA SPOTLIGHT: MEET THE DEVELOPERS OF THE UPCOMING SECURITY AIRWORTHINESS TRAINING COURSE.

**Billy Martin, WSU - NIAR - Environmental Test Lab Director**

Billy Martin is a Senior Research Scientist at Wichita State University’s National Institute for Aviation Research (NIAR). He is one of the world’s most renowned experts in HIRF and Lightning standards, testing, design, and certification. Billy has over 30 years of experience in the aircraft industry, most of which he has been a DER in HIRF, Lightning, and all other Electromagnetic Effects. Billy is the Chair of the SAE AE-2 Lightning Committee, and has been a major contributor to numerous other committees for 20+ years. He has been involved with RTCA since 1990 and was one of the principal technical members of Special Committee (SC)-135.

**Ernie Condon, Course Instructor**

Ernie Condon is a Senior Research Test Engineer at NIAR, and is a research consultant for direct and indirect effects of lightning. Previously, he worked as a consultant DER for HIRF/Lightning and worked at Hawker Beechcraft for 28 years. During his time at Hawker Beechcraft, Ernie worked as the company’s top FAA approved Certification Engineer (DER/DOA) in EME, HIRF, and lightning (direct and indirect effects).

**Ted Kalthoff, Course Instructor**

Ted Kalthoff, has a master’s degree in Computer System Security and Software Architecture. He is currently employed as a Cyber Protection Analyst for Spirit AeroSystems. Ted worked as an apprentice Software UM (certification engineer) for 4 years at Cessna Aircraft Company specializing in both developing and certifying software for Part 23 and Part 25 aircraft. He also worked previously at Hawker Beechcraft creating and approving software certification document.

He received his Bachelor of Science, Electrical Engineering from Wichita State University. His certifications include part 23 certification engineer (DOA/AR/DER,) part 25 certification engineer (DER) for EME/HIRF/Lightning, and certified six sigma expert/black belt.
RTCA WELCOMES NEW MEMBERS

Acentiss GmbH
Ottobrunn, Munich GERMANY
Fabian Schutte

Acentiss is a fast-growing tech-company leading the market through innovative solutions for safety critical systems in aerospace, automotive and medical industries. Their focus lies on system analysis, aircraft design and development of lightweight structures, avionic, control engineering, hard- and software development as well as project and interim management. Acentiss is certified to EN 9100.

Adinwest LLC
Tempe, Arizona USA
Arif Hossain

AdinWest is a VLSI and advanced technology services provider offering comprehensive solutions from initial concept development to prototype realization and mass market release in the semiconductor space. They offer an integrated portfolio of services to their clients in key domain areas including digital, analog, high speed IO, power management as well as embedded systems.

Their expertise spans multiple industry segments including Automotive, Consumer Electronics, Industrial IoT, Medical and Aerospace. They help their customers solve challenging problems, develop innovative solutions and meet aggressive time-to-market schedules by delivering first pass silicon designs and supporting collateral and engage with product engineering teams across the globe to design System-on-Chip.

AVIC Leihua Electronic Technology Research Institute
Wuxi, Jiangsu CHINA
Ye Zhou

Founded in 1970, China Aviation Industry Corporation Leihua Electronic Technology Research Institute is the only professional research institute for aircraft/ballistic radar in China. It is headquartered in Wuxi, with R&D base and production test base.

The institute has strong independent research and development innovation capability and mass production capacity. It has advanced airborne radar and radio frequency integrated system laboratory, microwave antenna test laboratory, avionics system RF integrated simulation aviation technology key laboratory and postdoctoral research station; It has successively obtained more than 300 scientific and technological achievements from the state, provincial and ministerial levels, and the series of technologies and products such as airborne active phased array radar, ultra-high resolution synthetic aperture radar and airborne multi-function weather radar have reached domestic leading position. The world’s advanced level; currently undertakes nearly 100 state-of-the-art technology research, model development and product delivery tasks to meet the needs of airborne radar and avionics equipment for all types of military and civilian active aircraft and new generation aircraft.

The military products field covers the main product lineages of airborne fire control radar, search surveillance radar, synthetic aperture radar, meteorological detection and navigation radar, early warning radar, and missile radar. The civil aircraft field and foreign joint venture research and development of China’s large passenger aircraft integrated surveillance system to fill the domestic gap, simultaneously expand the navigation and branch line passenger-related business to meet the domestic and international market demand; the civilian product field through technology derivative, development and production of various types of surface sea surface microwave radar, microwave devices, special test equipment and other high-tech products.

Since 2014, under the guidance of the strategy of “market leadership, innovation-driven, agile operation and related diversification”, the institute is making strides toward the top domestic and internationally renowned radar and electronic system research institutes, and constantly exploring new airborne radars.

CCxH, LLC
Washington, DC USA
Steven Hofmann

CCxH provides highly specialized, C-level consulting / advice directly to senior leadership of US Air Force Research Labs (AFRL), Air Mobility Command (AMC), and US Transportation Command (USTRANSCOM), plus industry team members engaged in providing advanced-technology solutions for global transportation planning and control as well as cyber security aviation matters.

Constellation Aviation Solutions, LLC
Washington, DC USA
Salim Janjua

Constellation Aviation Solutions LLC (CAS), headquartered in Orlando, FL, is a Veteran Owned Small Business. Since 2005, CAS has provided Engineering, Safety, Acquisition, Implementation/Deployment, and Program Management-related services to local, State, Federal government, and private sector customers.

(continued on page 8)
RTCA WELCOMES NEW MEMBERS

Defense Science and Technology Agency
Singapore, SINGAPORE
Seow Kie Chua

Defence Science and Technology Agency is a government organization that provides technological solutions to the Singapore Armed Forces (SAF). It also advises Ministry of Defence, Singapore on defense science and technology matters. Additionally, the agency designs, develops, and maintains defense systems and infrastructure; provides engineering and related services in defense areas; and promotes and facilitates the development of defense science and technology in Singapore.

Enabling Technology and Innovation, Inc.
Warner Robins, Georgia USA
Harold Kimball

ETI develops Operational Flight Programs (OFPs) for military avionics installed on F-15, F-16 and Little Bird helicopter. Additionally, ETI provides Software Integration Lab (SIL) simulation software that provides data over ARINC-429, ARINC-661, RS-422, ARINC-818 and MIL-STD-1553.

Hangguang Satellite Network Co., Ltd.
Beijing, CHINA
Zijun Wang

Aviation SAPPREF Satellite Network Co., (Ltdhereinafter referred to as “HangGuang”, is a world-leading technical solution provider and platform operator of IFEC and ATG broadband system. Driven by innovation technology of ATG+Satellite, HangGuang can provide a total solution including network, hardware, software and system, which covers both ATG broadband system and SAPPREF live TV system. HangGuang has established a cooperation relationship with Air China, China Southern Airlines, Hainan Airlines and China Eastern Airlines.

Hidden Level
Mino, New York USA
Kevin Nasman

Hidden Level, Inc is made up of engineers that have been involved in the emerging UAS market for over 10 years. Starting in the DoD world with larger scale UAS integration of class 4 and class 5 craft, to counter-UAS initiatives for the Army, they tackled many challenges for detecting, tracking, and classifying UAS with radars, passive RF, and slew to cue cameras. In the last 4 years they had worked in the commercial industry to help NASA and other invested parties integrate smaller UAS for the multitude of applications that have opened. Their focus is on sensing with the goal to provide a safe operating environment for the integration of UAS into the national airspace.

Mitsubishi Electric Corporation
Tokyo, JAPAN
Masatoshi Abe

Mitsubishi Electric Corporation develops, manufactures, distributes, and sells electrical and electronic equipment worldwide. The company offers turbine generators, nuclear power plant and power electronics equipment, motors, transformers, circuit breakers, gas insulated switchgear, switch control and display devices, surveillance-system control and security systems, transmission and distribution systems, locomotive and rolling stock electrical equipment, elevators, escalators, building security and management systems, and others. It also provides programmable logic controllers, inverters, servomotors, human-machine interfaces, hoists, magnetic switches, circuit breakers, time and power meters, uninterruptible power supply, industrial fans, computerized numerical controllers, electrical-discharge and laser processing machines, industrial robots, clutches, automotive electrical equipment, car electronics and mechatronics, car multimedia, and others. In addition, the company offers wireless and wired communications systems, network camera systems, satellite communications and radar equipment, satellites, antennas, missile and fire control systems, broadcasting and information systems equipment, data transmission devices, network security systems, systems integration products, and others; and power modules, high-frequency devices, optical and LCD devices, and others. Further, it provides air conditioners, chillers, showcases, compressors, refrigeration units, air-to-water heat pump boilers, ventilators, photovoltaic systems, hot water supply systems, IH cooking heaters, LED and fluorescent lamps, indoor lighting, LCD televisions, refrigerators, electric fans, dehumidifiers, air purifiers, cleaners, jar rice cookers, microwave ovens, and others. Additionally, the company offers procurement, logistics, real estate, advertising, finance, and other services.

Nodeln Robotics
Burlington, Connecticut 06013
Suresh Kannan

Nodeln Robotics is a small organization that develops certifiable autonomy software for the nascent Urban Air Mobility Sector. They also work with Lockheed to provide A.I.-based technologies on the DARPA ALIAS Program Phase III.

Ophir Corporation
Littleton, Colorado USA
Lisa Spaeth

Ophir Corporation design, develop, manufacture and service laser radar products for military and commercial applications. They provide innovative, laser radar solutions aimed to increase aircraft flight safety, optimize wind turbine energy production. Their certifications include AS9100D and ISO 9001:2015 and military flight qualifications.
Optical Air Data Systems, LLC
Manassas, Virginia USA
Elizabeth Dakin

Optical Air Data Systems, LLC (OADS), a high technology, award winning Small Business, is a rapid developer of lightweight, rugged Laser Doppler Velocimetry solutions for real world precision measurement applications. OADS has a state-of-the-art design, engineering, manufacturing, as well as field and flight test facility located in Manassas, Virginia. Born out of the aerospace industry, OADS has established itself as a world leader in the development of customized all-fiber optic motion-compensated solutions that meet the reliability, maintainability, and survivability requirements essential for platform-based sensors. Over its 25-year history, OADS’ experienced management and engineering team has launched numerous products including the world’s first laser-based air data system for rotary and fixed wing aircraft, LDV for wind turbine control, hand held laser wind sensors, as well as laser range finders.

Securboration Inc.
Melbourne, Florida USA
Lee Krause

Securboration, Inc. designs and develops scenario generation simulation solutions. The company offers service-oriented architecture, adversarial modeling, collaborative systems, business process functionality, and semantic modeling services. Additionally, it provides cyber warfare, socio cultural modeling, and information disclosure research services. Its clientele includes Air Force Research Laboratory, US Joint Forces Command, US Army, and Office of Naval Research.

Skyryse
Hayward, California USA
Jason Rexing

Skyryse is an autonomous air mobility company developing advanced pilot assistance systems. The company’s innovative technology focuses on vertical take-off and landing in flight, to provide the flight transportation industry with a cost-effective alternative to mainstream technology, while increasing flight safety and passenger comfort.

Public Joint Stock Company (Ukrainian Scientific and Research Radio Equipment Institute)
Kiev, UKRAINE
V. Sokolova

The company specializes on the development, testing and serial production of aviation onboard equipment for different purposes for different types of aircraft.

Currently, the company produces several high-tech certified equipment, having certificates of airworthiness completing products of State Aviation Administration of Ukraine.

The MicroStar Lab
Crystal Lake, Illinois USA
Jacklyn Radeni

MicroStar Lab began as a small industrial microbiology lab dedicated to providing quality microbiological testing for a few specific manufactured products and a limited number of industries. Originally, they specialized in fungus and bacteriological challenge tests for paint, paper, and gypsum board. They have evolved into one of the world’s premier mold-resistance testing facilities.

The testing MicroStar Lab performs can only be run well by microbiologists. Neither fungus nor bacteria testing can be easily added to the scope of tests offered by a mechanical or electrical laboratory. The skills required to perform microbiological testing are different than those of engineers. Mold-resistance testing methods, such as the MIL-STD-810 Method 508 and ASTM G-21, require a very high level of expertise to achieve reliable, consistent, and reproducible results. This level of expertise can only be attained through years of experience, proper training, internal audits, a dedicated management team, and world-class facilities.

Many of the fungus tests they perform use USDA permitted organisms. Only USDA inspected, and approved laboratories are cleared to purchase, use, and maintain these organisms. Their extensive culture collections contain many USDA permitted organisms of both bacteria and fungus, making testing experience with MicroStar Lab effortless.

Via Technology Ltd.
Poole, UNITED KINGDOM
Kenneth Barker

Via Technology has performed research and development services for major ATM system companies and ANSPs including: Thales, Leidos, NATS and Eurocontrol for over 15 years.

Three years ago, Via Technology developed and patented a new method for detecting potential conflicts between free-routing aircraft. Since then Via Technology have developed several prototype tools to prove the concept. Via Technology are currently working towards AS9100 certification and developing production version of the tools to the RTCA DO-278A standard.

Via Technology currently offer aviation and ATM research and development services. However, they plan to offer AS9100 certified software development and long-term interaction detection tools as soon as AS9100 certification is achieved.
NAVIGATION EQUIPMENT USING THE GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS)


Details of the deliverables can be found in the Terms of References (TOR) on the RTCA SC-159 webpage.
The holiday season is the perfect time to say...

It's a pleasure working with you

Season's Greetings
From the RTCA Staff
SC-135 met in late October in Morris Plains, New Jersey and was hosted by Honeywell. The Committee had three days of Working Group (WG) meetings before holding their Plenary on the final day. The Ground Station Environment WG is working on a new document to provide environmental test conditions to qualify equipment to be installed in ground stations. In addition, section change coordinators hosted sessions to review proposed changes to include Revision H for DO-160, Environmental Conditions and Test Procedures for Airborne Electronic/Electrical Equipment and Instruments.

During the Plenary, the group worked to harmonize the accepted change proposals with representatives from EUROCAE WG-14. A new process is in place to coordinate all change proposals raised against either DO-160() or ED-14() between both committees. The update to the DO-160H is expected to be published in 2022. The new document for Ground Station Environment test is expected to be complete in 2020.

SC-186 met in Plenary on November 2nd, at RTCA Headquarters in Washington, DC. The Committee closed the review process on the updated version of the DO-317B, Minimum Operational Performance Standards (MOPS) for Aircraft Surveillance Applications (ASA) System Appendix U that was opened for Final Review and Comment (FRAC) in September. The document is expected to be presented to the Program Management Committee (PMC) in March of 2019 for publication. In addition to the Appendix U update of DO-317B, the Committee is also working toward revisions to DO-361, Minimum Operational Performance Standards (MOPS) for Flight-deck Interval Management (FIM), DO-260, Minimum Operational Performance Standards for 1090 MHz Automatic Dependent Surveillance - Broadcast (ADS-B) and DO-282, Minimum Operational Performance Standards for Universal Access Transceiver (UAT) Automatic Dependent Surveillance - Broadcast (ADS-B) all scheduled in the first quarter of 2020.
SC-206 met in early December at Harris Technology Center, Palm Bay, FL.

Sub-Group 1 (SG-1) led by Steve Darr (Dynamic Aerospace) and Ed Johnson (FAA) continued work on activities supporting ADS-Wx / Mode S Wx requirements addressing the committee’s Inter-Special Committee Requirements Agreements (ISRAs) with SC-186, Automatic Dependent Surveillance-Broadcast (ADS-B) and SC-209, Air Traffic Control Radar Beacon System/Mode Select (ATCRBS/Mode S) Transponder through the Combined Surveillance Committee (CSC) WxS SG.

SG-5, under the leadership of Co-Chairs Paul Freeman (Harris Corporation) and John Ferrara (Ferrara Consulting), completed work on DO-358A, Flight Information Services Broadcast (FIS-B) with Universal Access Minimum Operational Performance Standard (MOPS), for Final Review and Comment (FRAC). During the Plenary, SC-206 approved the release of the document for FRAC. The FRAC resolution is scheduled for March and will be presented to the Program Management Committee (PMC) in June.

SG-6 led by Eldridge Frazier (FAA) is working on revising DO-364, Minimum Aviation System Performance Standards (MASPS) for Aeronautical Information / Meteorological Data Link Services as a joint document with EUROCAE Working Group (WG)76 expecting delivery in late 2020.

SC-209 met in a joint Plenary with EUROCAE Working Group (WG) 49 in early October, at RTCA Headquarters. The meeting convened at the end of a week which saw the Combined Surveillance Committee (CSC) meet in support of their effort to update the Mode S Transponder and ADS-B 1090ES MOPS.

SC-209 is developing Revisions to Transponder Minimum Operational Performance Standards (MOPS), DO-181E which they expect to deliver in December of 2019. The document is expected to be presented to the Program Management Committee (PMC) in March of 2020 for publication.

The committee noted the passing of Bob Saffell, Co-chair for SC-209. His expertise and passion for his work will be missed by all.
Airborne Weather Detection Systems

DO-220A Change 1, Minimum Operational Performance Standards (MOPS) For Airborne Weather Radar Systems

Issued 08-17-2018 | Prepared by SC-230

This document contains Minimum Operational Performance Standards (MOPS) for Airborne Radar Systems that may include any combination of the following functions: weather detection, ground mapping, forward-looking windshear detection, forward-looking turbulence detection, or atmospheric threat awareness capability.

Since the last revision to DO-220, there have been many technological advances in the field of airborne weather radar. DO-220A incorporates updates and corrections to the previous version. In addition to modernizing the requirements and test procedures for the weather, ground mapping, and predictive windshear functions set out in its predecessors, specifications for radar detection of turbulence and atmospheric threat awareness were added. Any of these functions may be implemented individually or in combination with any others. DO-220A has been designed so that the requirements and test procedures for each function are grouped into distinct sections to facilitate testing and showing of compliance.

These standards specify system characteristics that should be useful to designers, manufacturers, installers, and users of the equipment.

DO-220A Change 1 Reference Supplement

Issued 08-17-2018 | Prepared by SC-230

This Reference Supplement includes the following items referenced in DO-220A Change 1:

- NASA Windshear Database Models, NASA Langley Research Center
- ADWRS, Airborne Doppler Weather Radar Simulation program, NASA Langley Research Center. (Note: NASA developed the initial version of ADWRS in FORTRAN. They continue to refine and develop this simulation, including versions in other computer languages. Submit any requests for this software in computer languages other than FORTRAN directly to NASA. NASA will provide source code in the requested computer language if it has already been developed and is available for release. Contact NASA directly at Software Release Authority, NASA Langley Research Center, Hampton, VA 23681-2199)
- NASA Turbulence Event Scenarios, NASA Langley Research Center

Enhanced Vision


Issued 10-05-2018 | Prepared by SC-213

This document provides the minimum operational, safety, and performance requirements (SPR) and interoperability requirements by which takeoff operations using an Enhanced Flight Vision System (EFVS) can be safely conducted in natural visibilities lower than currently authorized. These takeoff minima and associated SPRs are established for the use of EFVS, treated as subsystems, which together with other subsystems including navigational aids and airport lighting and markings, meet the operational goal/intended function and achieve the levels of reliability, availability, and integrity.
consistent with other systems and subsystems used for the similar intended function and phase of flight. In this document, recommendations for EFVS takeoff minima are defined with various associated aircraft equipage, operational and interoperability requirements, and airport infrastructure. The visibility minima are defined in terms of natural visibility since, in the event of a failure or failures, the PF uses a combination of the remaining functional elements, other aircraft subsystems, and available out-the-window natural vision cues (e.g., lights and/or markings of the runway) to mitigate the failure effects and conduct a safe, successful takeoff or rejected takeoff.

DO-371, Minimum Aviation System Performance Standards (MASPS) for Aircraft State Awareness Synthetic Vision Systems
Issued 01-9-2018 | Prepared by SC-213

DO-371 was originally prepared by RTCA Special Committee (SC) 213 jointly with EUROCAE Working Group (WG) 79. This document expands the previously defined DO-315A intended function of an SVS beyond that of supplemental view of the external scene to include enhanced aircraft attitude and energy state awareness and defines a system that is intended to be presented full-time on the pilots’ full color Primary Flight Displays (PFD).

This document has been released as a technically equivalent document with ED-249.

Global Positioning System

DO-373, MOPS for GNSS Airborne Active Antenna Equipment for the L1/E1 and L5/E5a Frequency Bands
Issued 06-21-2018 | Prepared by SC-159

The purpose of this MOPS is to specify performance requirements for an active integrated dual frequency GNSS Aviation Antenna. This includes requirements that address reception of GNSS signals that support safety of life aviation applications in the L1/E1 (centered at 1575.42 MHz) and L5/E5a (centered at 1176.45 MHz) bands. The requirements developed in this antenna MOPS support a range of flight phases including enroute, terminal, approach, precision landing and surface operations. In comparison to RTCA/DO-301, this antenna MOPS specifies better needed performance in the L1/E1 band for parameters including (but not limited to) G/T, group delay differential, axial ratio and boresight frequency response.

Required Navigational Performance

DO-257B, Minimum Operational Performance Standards (MOPS) for the Depiction of Navigational Information on Electronic Maps
Issued 03-22-2018 | Prepared by SC-227

This document supersedes RTCA DO-257A, Minimum Operational Performance Standards (MOPS) for the Depiction of Navigational Information on Electronic Maps, published on June 25, 2003. This MOPS update supports new requirements for electronic display outputs in DO-236C/ED-75D and DO-283B; reflects the most current human factors standards and guidelines for electronic displays; and embraces display system technology updates. DO-236C/ED-75D contains the Minimum Aviation System Performance Standards (MASPS) for Required Navigation Performance (RNP) equipment, while DO-283B defines the RNP equipment MOPS. Special Committee (SC) 227 completed the recent updates to both these standards to better support worldwide implementation RNP operations. DO-257B supports the RNP MASPS and MOPS by directly incorporating and reflecting the display output requirements of both documents. The updates to DO-257A also ensure installed RNP equipment meets the requirements for today’s RNP operations via presentation of essential navigation information on the electronic displays the flight crew uses. This includes new, updated specifications for a plan view map (i.e. the aircraft’s “navigation display”). Likewise, the new electronic display MOPS reflect updates in human factors guidelines for cockpit displays, revisions to the standards for an airport moving map display and robust standards for presentation of a vertical situation display a flight crew can use in flight. (continued on page 16)
2018 Documents (continued)

Security
DO-356A, Airworthiness Security Methods and Considerations
Issued 06-21-2018  |  Prepared by SC-216
This document is the joint product of two industry committees: EUROCAE Working Group (WG) 72, Aeronautical Systems Security, and RTCA Special Committee (SC) 216, also titled Aeronautical Systems Security.

This document provides a set of methods and guidelines that may be used within the airworthiness security process defined in RTCA DO-326A / EUROCAE ED-202A, Airworthiness Security Process Specification. It is recognized that alternative methods to the processes described or referenced in this document may be available to an organization desiring to obtain certification.

This document does not provide guidelines concerning the structure of an individual organization or how the responsibilities for certification activities are divided. No such guidance should be inferred from the descriptions provided.

DO-230I, Standards for Airport Security Access Control Systems
Issued 06-21-2018  |  Prepared by SC-224
The document provides guidance on designing for and acquiring airport security access control systems, testing and evaluating system performances, and operational requirements.

It should be emphasized that these guidelines and standards are not regulatory in nature but represent the industry's derived consensus on standards and provisions to be met in achieving consistency and interoperability in an airport access control environment.

This updated document incorporates the latest technological advances in the Credentialing section. The nature of the changes in available technology, and the need to enhance sub-sections pertaining to the credentialing process, identity verification enhancements with the criminal history records checks, inspection process for credential holders, and enhanced oversight outlined by the TSA. Guidance for a credentialing operational checklist were also added to this section.

Standards for Air Traffic Data Communication Services
DO-281C, Minimum Operational Performance Standards (MOPS) for Aircraft VDL Mode 2 Physical Link and Network Layer
Issued 09-20-2018  |  Prepared by SC-214
The material in this document highlights the minimum procedures for the physical link and network layer of the VDL Mode 2 subnetwork. The test procedures used in this document have been coordinated with EUROCAE Working Group (WG) 92 during the preparation of EUROCAE Document ED-92C. Appendix E provides a differences table between RTCA DO-281C and EUROCAE ED-92C.

This document includes four other appendices. Appendix B should be considered a normative appendix.

DO-224D, Signal-In-Space Minimum Aviation System Performance Standards (MASPS) for Advanced VHF Digital Data Communications Including Compatibility with Digital Voice Techniques
Issued 09-20-2018  |  Prepared by SC-214
The purpose of this document is to define Minimum Aviation System Performance Standards (MASPS) for the signal-in-space characteristics for advanced Very High Frequency (VHF) digital data communications, including compatibility with digital voice techniques. The MASPS document is divided into three sections; an introduction, aviation user requirements, and technical characteristics.

The introductory section provides VHF communications system characteristics including aeronautical VHF communications frequencies (continued on page 17)
utilized and its implications to spectrum congestion.

The aviation user requirements section identifies the users of the systems and specific aircraft characteristics.

The technical characteristics section describes the new system. Two modes of operation are defined: VDL Mode 2 and VDL Mode 3.

Traffic Alert & Collision Avoidance System (TCAS)

DO-385 Volume I and II, Minimum Operational Performance Standards (MOPS) for Airborne Collision Avoidance System X (ACAS X) ACAS Xa and ACAS Xo)

Issued 10-02-2018 | Prepared by SC-147

The ACAS X MOPS: Specifies minimum requirements for a collision avoidance system including surveillance, tracking and threat resolution functionalities. These MOPS specify the optimized logic methodologies used by the collision avoidance logic and its performance, as well as providing testing of all requirements.

DO-385 Supplements

Issued 10-02-2018 | Prepared by SC-147

Look-up Tables and Test Suite files. Part of the Final Review and Comment (FRAC) process and required to implement ACAS X and validate that implementation.

FAA Program Office Documents used as justification for final performance of ACAS X system and tools implementers may want to use in their development. These materials are not required to decipher the MOPS or implement the system and were not part of the FRAC/Open Consultation (OC) process.

Weather Detection

DO-213A Change 1, Minimum Operational Performance Standards (MOPS) for Nose-Mounted Radomes

Issued 06-21-2018 | Prepared by SC-230

This document contains Minimum Operational Performance Standards (MOPS) for radomes for use with airborne weather radars with or without forward-looking windshear detection capability. These standards specify radome characteristics for designers, manufacturers, installers, and users of the equipment.

It establishes radome performance requirements to ensure that the radome characteristics do not adversely interfere with the performance of weather radar systems, including those with predictive windshear functions. It also includes testing requirements to ensure that the radome continues to perform correctly after repair.

For additional information and to order documents, visit RTCA’s store at https://my.rtca.org/nc__store. RTCA Members may download electronic documents at no cost and qualify for a 60% discount on paper documents.
SC-213 held a joint Plenary with EUROCAE Working Group (WG) 79 in October to approve the final document in its Terms of Reference (TOR) and discuss the future work that the publication of the *Minimum Aviation System Performance Standards (MASPS) for a Combined Vision Systems for Helicopter Operations*.

The joint committee reviewed and resolved all comments received on the MASPS and approved a motion to send the document to the Program Management Committee (PMC) and EUROCAE Council for publication. Publication is expected in early 2019.

SC-213 also approved updates to their TOR to take the body of documents they produced and combine the information into two MASPS: one for Enhanced Vision Systems/Enhanced Flight Vision Systems (EVS/EFVS) and one for Synthetic Vision Systems (SVS). Both documents would address Complete Vision Systems and are expected to be created jointly with WG-79.
SC-217 met jointly with EUROCAE Working Group (WG) 44 in October, at SIA in Bordeaux, France. The Joint Committee completed its work, updating the joint document DO-201A/ED-77, *User Requirements for Navigation Data*. They addressed all comments and came to consensus to recommend to the Program Management Committee (PMC) and the EUROCAE Council for publication. Publication will take place after ICAO Doc 10066 is published.

At the December PMC, The Committee will request to go into hiatus for at least 12 months. Thereafter, the committee would like to meet with WG-44 to discuss updates to the documents they offered and address the idea of a potential standard of requirements for Aeronautical Databases when used by Unmanned Aerial Systems (UAS).

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**AIRPORT SECURITY ACCESS CONTROL SYSTEMS**

SC-224 met in mid-November to work on DO-230J, *Standards for Airport Security Access Control System*. This version will primarily update the credentialing, procurement, biometrics and video sections. This document is expected to be published Fall 2019.
AERONAUTICAL MOBILE-SATELLITE (R) SERVICE

SC-222, met jointly with Working Group (WG) 82, chaired by Armin Schlereth, DFS GmbH, virtually in November. The groups approved the release of DO-343B/ED-242A, Minimum Aviation System Performance Standard (MASPS) for AMS(R)S Data and Voice Communications Supporting Required Communications Performance (RCP) and Required Surveillance Performance (RSP) and DO-262D/ED-243A, Minimum Operational Performance Standards (MOPS) for Avionics Supporting Next Generation Satellite Systems (NGSS) for Final Review and Comment (FRAC) / Open Consultation (OC). They expect to present to the Program Management Committee (PMC) and EUROCAE Council by March 2019 for publication release.

Next Meeting
January 24-25, 2019, Virtual
MINIMUM OPERATIONAL PERFORMANCE STANDARDS (MOPS) FOR UNMANNED AIRCRAFT SYSTEMS

SC-228 has been a very active committee in 2018. The progress of the committee shows the commitment to the plan of producing complete documents on an aggressive schedule supporting a fast-evolving UAS industry.

They remain on schedule for producing revisions to the original DO-362, DO-365, DO-366 in 2019 and 2020 as well as new documents covering Minimum Operational Performance Standards (MOPS) for a ground-based sensor, MOPS for an airborne sensor, and extensions to point-to-point C2 architectures to address Beyond-Radio-Line-of-Sight (BRLOS) applications.

SC-228 members meeting at RTCA Headquarters

STANDARDS FOR WIRELESS AVIONICS INTRA-COMMUNICATION SYSTEM (WAIC) WITHIN 4200-4400 MHZ

SC-236 met in joint Plenary with EUROCAE Working Group (WG) 96 in Tokyo, Japan and was hosted by Panasonic. During the meeting, the joint committee finished drafting its first document, Minimum Aviation System Performance Specification (MASPS) for Coexistence of Wireless Avionics Intra-Communication Systems (WAIC) within 4200-4400 MHz. At the end of the week, the group approved initiating Open Consultation/Final Review and Comment (OC/FRAC). Comments will be addressed at the January 2019 Plenary. Publication is expected in March 2019.

In addition, the 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 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.

SC-236 Committee

COMMITTEE
SC-236, Standards for Wireless Avionics Intra-Communication System (WAIC) within 4200-4400 MHz

CHAIR
Steve Rines, Zodiac Inflight Innovations

NEXT MEETING
January 15-17, 2019, Mobile, Alabama at Airbus
DO-178C, SOFTWARE CONSIDERATIONS IN AIRBORNE SYSTEMS AND EQUIPMENT CERTIFICATION, TRAINING COURSE

April 1-3 at RTCA
June 17-19 at RTCA
September 9-11 at RTCA
December 2-4 at RTCA

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, Formal Methods Supplement to DO-178C, 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

April 4 at RTCA
June 20 at RTCA
September 12 at RTCA
December 5 at RTCA

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.

*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.
DO-254, DESIGN ASSURANCE GUIDANCE FOR AIRBORNE ELECTRONIC HARDWARE, TRAINING COURSE

April 8-10 at RTCA
September 9-11 at RTCA
December 9-11 at RTCA

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 1-4 at RTCA
October 8-11 at WSU
December 2-5 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.
SC-230 met in November at RTCA to kick off two new projects. The first is to conduct a feasibility study on clear air turbulence detection using Airborne LIDAR Systems with a projected completion date in early 2020. The second is an update to DO-220A Change 1, Minimum Operational Performance Standards (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.

COMMITTEE
SC-230, Airborne Weather Detection System

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

NEXT MEETING
January 24, 2019. Virtual

SC-230 reviewing NASA/FAA Flight Test Results
RTCA 2018 HIGHLIGHTS
RTCA CALENDAR

December

December 3-5  
DO-254 Training Course  
Hosted by RTCA  
Washington, DC

December 3-6  
SC-206, Aeronautical Information and Meteorological Data Link Services  
Hosted by Harris Corporation  
Palm Bay, FL

December 4  
SC-216, Aeronautical Systems Security  
Hosted by RTCA  
Virtual

December 10-14  
SC-223, Internet Protocol Suite (IPS) and AeroMACS  
Hosted by Frequentis  
Vienna, Austria

December 11-14  
DO-160G Training Course  
Hosted by RTCA  
Washington, DC

December 11-13  
DO-178C Training Course  
Hosted by RTCA  
Washington, DC

December 13  
PMC, Program Management Committee  
Hosted by RTCA  
Washington, DC

December 14  
Supplements to DO-178C Training  
Hosted by RTCA  
Washington, DC

January

January 15-17  
SC-236, Standards for Wireless Avionics Intra-Communication Systems (WAIC) within 4200-4400 MHz  
Hosted by Airbus  
Mobil, AL

January 17  
SC-224, Airport Security Access Control Systems  
Hosted by RTCA  
Washington, DC

January 24-25  
SC-222, AMS*S  
Hosted by RTCA  
Washington, DC

February

February 12-13  
SC-230, Airborne Weather Detection Systems  
Hosted by RTCA  
Virtual

March

March 11-15  
SC-223, Internet Protocol Suite (IPS) and AeroMACS  
Hosted by RTCA  
Washington, DC

March 14  
SC-224, Airport Security Access Control Systems  
Hosted by RTCA  
Washington, DC

March 18-22  
SC-206 (SG-5)  
Hosted by Harris Corporation  
Herndon, VA

March 18-22  
SC-206 (SG-1 & SG-5)  
Hosted by EUROCONTROL  
Brussels, Belgium

March 21  
Program Management Committee (PMC)  
Hosted by RTCA  
Washington, DC

April

April 1-4  
DO-160G Training  
Hosted by RTCA  
Washington, DC

April 1-3  
DO-178C Training  
Hosted by RTCA  
Washington, DC

April 4  
Supplements to DO-178C Training  
Hosted by RTCA  
Washington, DC

April 8-10  
DO-254 Training  
Hosted by RTCA  
Washington, DC

April 25  
SC-135, Environmental Testing  
Hosted by RTCA  
Washington, DC