



RTCA Special Committee 203

By John Walker & Ken Geiselhart, SC-204 Co-Chairs

Update UAS Standards Development

RTCA, Inc. is a private, not-for-profit corporation based in Washington DC that develops consensus-based standards regarding communications, navigation, surveillance, and air traffic management (CNS/ATM) system operations and technical performance. It functions as a Federal Advisory Committee to present recommendations to the Federal Aviation Administration (FAA) for policy, program, and regulatory consideration. These same recommendations are used by the private sector for system development, investment, and related business decisions.

RTCA includes over 360 government, industry, and academic organizations from the United States and around the world. Member organizations represent essentially all facets of the aviation community, including government organizations, airlines, airspace users, airport associations, labor unions, and aviation service and equipment suppliers. A sampling of RTCA U.S. membership includes the FAA, Air Line Pilots Association (ALPA), Air Transport Association of America (ATA), Aircraft Owners and Pilots Association (AOPA), ARINC Incorporated, The Boeing Company, Department of Defense (DoD), GARMIN International, Honeywell International, Inc., The Johns Hopkins University, Lockheed Martin, MIT Lincoln Laboratory, MITRE/CAASD, NASA, National Business Aviation Association (NBAA), and Raytheon.

RTCA is also supported by approximately 110 International Associates, including Airservices Australia, Airways Corporation of New Zealand, the Chinese Aeronautical Radio Electronics Research Institute (CARERI), EUROCAE, EUROCONTROL, NAV Canada, Smiths Industries, Society of Japanese Aerospace Companies, Thales Avionics Limited, the United Kingdom Civil Aviation Authority, Transport Canada, and many more.

Issue-oriented Special Committees, formed and staffed by government/industry volunteers to accomplish specific tasks, constitute the working committees of RTCA. As with all Federal Advisory Committees, meetings are publicly announced in the U.S. Federal Register; and participation is open to anyone with interest in topics being considered. During Special Committee meetings, participants explore the operational and technical ramifications of selected topics. Resulting consensus recommendations are presented to the RTCA Program Management Committee (PMC) for approval; or direction is provided for further consideration. All interested parties with a need for aviation CNS/ATM issue resolution can petition the PMC to organize a Special Committee.

With over 550 registered members, RTCA Special Committee 203 (SC-203) has broad representation from within the aviation stakeholder community, including U.S. Government Agencies (FAA, the DOD and DHS, etc.), airspace user associations (ALPA, AOPA, NBAA, etc.), trade associations (AIA, UNITE, etc.), manufacturers and

equipment suppliers (AAI, Boeing, General Atomics, Honeywell, Lockheed Martin, Northrop Grumman, Rockwell Collins, etc.), and international representatives (EUROCONTROL, EUROCAE, ICAO, etc.).

Due to increasing use of Unmanned Aircraft Systems (UAS) by public organizations, and recognition that UAS operations will continue to grow, SC-203 was established in October 2004. It is chartered to develop recommended UAS Minimum Aviation System Performance Standards (MASPS) necessary to mitigate the technical and operational challenges of integrating UAS into the National Airspace System (NAS). SC-203 Terms of Reference (TOR) include delivery of: 1) UAS system-level MASPS, 2) UAS control and communications MASPS, and 3) UAS sense and avoid MASPS.

As a first step, the committee developed a document entitled *Guidance Material and Considerations for Unmanned Aircraft Systems (RTCA Document # DO-304)*. Published in March 2007, DO-304 presents a comprehensive set of UAS definitions and assumptions, representing harmonized views from both the piloted and unmanned aircraft communities. This document includes small UAS best practices guidance.

More recently, as specified in its TOR, SC-203 is undertaking assessments necessary to first establish the Operational Safety, Performance, and Interoperability Requirements Standard for UAS. These tailored products will establish the basis for subsequent UAS MASPS development; consistent with methods described in DO-264, «Guidelines for Approval of the Provision and Use of Air Traffic Services Supported by Data Communications». Moreover, to better position the committee for this comprehensive systems engineering analysis, the leadership team expanded to include designated product leads assigned for each DO-264 artifact.

The evolving SC-203 technical baseline will include concurrent development of UAS operational scenarios, operational and functional requirements, and architectural products necessary to capture and describe UAS operational and system behaviors within all classes of airspace. Corresponding UAS technical assessments will be presented in the form of an Operational Services and Environment Description (OSED), a Multi-Attribute Risk Assessment (MARA), an Operational Safety Assessment (OSA), an Operational Performance Assessment (OPA), and an Interoperability Assessment (IA). This product development waterfall includes completion dates that range from 2009-2015. Initial recommendations will be published as an Operational Safety, Performance, and Interoperability Requirements (OSPIR) Standard with accompanying UAS system-level MASPS delivered in 2016. Control and Communication MASPS are targeted for delivery in 2017 with Sense and Avoid MASPS in 2019.

Accepting this as conservative schedule, the leadership team is working with representatives from the stakeholder

community to develop alternative strategies, in order to expedite development of these standards. This baseline work plan was discussed at the committee's 12th Plenary held in March 2008. Since that time, work continues to define alternative strategies to expedite this schedule.

To leverage talent from within SC-203 membership, consistent with the need for broad stakeholder engagement, the SC-203 work plan identifies specific requests for stakeholder coordination. This includes a stakeholder engagement plan with requests for shared resource contributions necessary to expedite the development process. Leveraging common engineering processes, methods, and tools across the stakeholder community remains essential; as does establishing a collaborative engineering environment to more effectively develop and maintain a shared UAS technical baseline. These are essential elements necessary to establish a basis from which to conduct comprehensive operational safety, performance, and interoperability assessments; requisite precursors to developing recommended MASPS with a higher probability of acceptance by safety regulators.

The importance of international coordination and cooperation relative to UAS standards development cannot be underestimated; and points above apply even more broadly to developing harmonized UAS international standards. Again, this includes the need for stakeholder coordination with shared resources leveraging common engineering processes, methods, and tools.

Equally important is a collaborative engineering environment to more effectively develop and maintain a UAS technical baseline. These are requisite precursors

necessary to develop UAS standards with a higher probability of acceptance by individual sovereign safety regulators. Without these, the burden of proof for UAS airworthiness in mixed manned/unmanned environments will fall to individual manufactures; ultimately a much more costly proposition.

For more information concerning future SC-203 Plenary meetings, please visit www.rtca.org or contact SC-203 via email at info@rtca.org.



Ken Geiselhart
Lockheed Martin, USA



John Walker
JSWalker Group, USA