

**TERMS OF REFERENCE**  
**Special Committee (SC) 236**  
**Standards for Wireless Avionics Intra-Communication System (WAIC)**  
**within 4200-4400 MHz**  
(Revision 7)

**ORIGINAL REQUESTOR:**

Organization	Person
Federal Aviation Administration	Margaret Gilligan Associate Administrator for Aviation Safety

**SC LEADERSHIP:**

Position	Name	Affiliation	Telephone	email	Change
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**BACKGROUND:**

There is a common interest among different sectors of the aeronautical industry to implement technologies providing wireless on-board communication services for functions with different levels of safety requirements. Consequently, aircraft manufacturers are planning to implement this technology in future aircraft. In many sectors of the aviation industry, development of different kinds of wireless technologies and applications were launched without harmonization and standardization on compatible technologies, standards, design assurance, or safety aspects. The

lack of a common safety guidance material and design assurance requirements can introduce significant variability in wireless technology, application, and protection for aviation products.

The use of wireless links for communication services provides new opportunities for the development of functions which are not possible using wired communications. It has the potential to enable improvements in safety and a reduction in weight, thereby enhancing efficiency.

Several organizations expressed interest in establishing a joint committee with European Organisation for Civil Aviation Equipment (EUROCAE) Working Group (WG) 96 to develop a Minimum Operational Performance Standard (MOPS). These members include: Airbus, UTC Aerospace Systems, GE Aviation, HarcoSemco, and the Aerospace Vehicle Systems Institute.

The radio frequency allocation for WAIC in the ITU Radio Regulations includes a reference to applicable Standards and Recommended Practices (SARPs) to be developed by ICAO. The responsible ICAO Frequency Spectrum Management Panel (FSMP) requested that technical means of compliance with those SARPs should be specified in RTCA and EUROCAE standards. This necessitates co-development and harmonization between ICAO, RTCA and EUROCAE to maximize the benefit of these documents. As ICAO SARPs will focus on aircraft-to-aircraft RF coexistence, which is a system-level issue, the most appropriate way to assure such harmonization is through development of MASPS for WAIC.

**DELIVERABLES:**

<b>Product</b>	<b>Description</b>	<b>FRAC Completion Due Date*</b>	<b>Change</b>
<b>DO-378 Rev A</b>	<b>Minimum Aviation System Performance Standard (MASPS) for Coexistence of Wireless Avionics Intra-Communication Systems within 4200-4400 MHz.</b>	<b>December 2022</b>	<b>May 2020</b>
<b>MOPS DO-XXX</b>	<b>Minimum Operating Performance Specification (MOPS) for Wireless Avionics Intra-Communication Equipment within 4200-4400 MHz</b>	<b>June 2023</b>	<b>October 2021</b>

\*Note: Final Review and Comment (FRAC) Completion Due Date refers to the date that the committee plenary approves the document after completing the FRAC Process. SCs should submit the final document at least 45 days before the PMC meeting where it will be considered for approval.

## **SCOPE:**

In addition to the ongoing work in EUROCAE WG-96 on development of a compliance process specification, the committee shall develop a MOPS for a WAIC component that allows WAIC systems to safely co-exist with Radio Altimeters in the frequency band 4,200 - 4,400 MHz. The MOPS will allow WAIC systems to share the band with Radio Altimeters and other WAIC systems such that:

- The safe operation of Radio Altimeters is not compromised; and
- Allows the worst-case performance of a WAIC system to be pre-determined.

These two aspects are major prerequisites for proof of airworthiness for future WAIC systems. In addition to general MOPS requirements, the MOPS shall also cover the following main requirements:

- General requirements for a WAIC component to comply with the ITU Radio Regulations;
- Coexistence of WAIC components and Radio Altimeters on-board the same aircraft;
- Coexistence of WAIC components and Radio Altimeters on-board different aircraft;
- Coexistence of WAIC components on-board the same aircraft; and
- Coexistence of WAIC components on-board one aircraft with WAIC components on-board other aircraft.

The development of wireless applications must take into account the key issue of spectrum availability, electromagnetic compatibility, and protection. The following aspects should be considered:

- Protection of spectrum versus this application to ensure the required performances and availability;
- Protection of other RF users against potential perturbations generated by this application, other users being obviously those which are aircraft embedded but also outside the aircraft; and
- Protection of aircraft safety systems against unauthorized access (cybersecurity safeguards).

## **ENVISIONED USE OF DELIVERABLE(S)**

### **MASPS:**

We intend that the revised MASPS will be used as a source of technical means of compliance with the ICAO SARPs for WAIC. The MASPS and the SARPs were intended to be developed concurrently. Since the initial publication of the MASPS, additional requirements in the SARPs have been identified. The technical means of compliance for the new requirements needs to be included in the new revision with the MASPS. Administrations seeking to approve the use of the WAIC spectrum by aircraft systems will need a way of verifying that such systems comply with ICAO SARPs. The planned delivery of the updated MASPS in 2020 is intended to allow approval of completed SARPs by ICAO FSMP in August 2020, for final SARPs publication.

### **MOPS:**

We anticipate that the MOPS will be referenced by the FAA in a Technical Standard Order and by

EASA in a European Technical Standard Order. This document is envisioned as a joint document with EUROCAE WG-96. The deliverable will provide general guidance to industry regarding the minimum performance standard and interoperability of a WAIC component. The intent is to inform future systems design and provide a basis for future regulatory documentation.

**SPECIFIC GUIDANCE:**

The planned revision of the MASPS will include addressing all comments that were deferred from the PMC meeting in June of 2019 where the initial release of DO-378 was approved.

Coordination should include:

- EUROCAE Coordination - function jointly with EUROCAE Working Group 96.
- RTCA Special Committee 216/EUROCAE WG-72- for potential cybersecurity impacts.
- RTCA Special Committee 239 and the joint EUROCAE WG for Radar Altimeter impacts

**Initial Documentation:**

The following documentation may be used as reference material. The committee may make reference to any other applicable material.

<b>Documents</b>	<b>Intended Use</b>
Final Acts World Radiocommunication Conference (WRC-15), 2-27 November 2015	Regulatory provisions for WAIC systems

**TERMINATION:** When the scope of this Terms of Reference is complete, the committee will recommend to the PMC that the committee Sunset, go into Active Monitoring Mode, or spend a period of time in Hiatus. Any change/extension in the committee’s work program requires prior PMC approval.