U.S. Department
of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Designing and Demonstrating Aircraft Tolerance to Portable Electronic Devices

Date: 6/9/17 **AC No:** 20-164A
Initiated By: AIR–100

1 PURPOSE.

1.1 This advisory circular (AC) identifies RTCA, Inc., document DO-307A, *Aircraft Design and Certification for Portable Electronic Device (PED) Tolerance*, dated December 15, 2016, as an acceptable means for designing and demonstrating aircraft tolerance to potential electromagnetic interference from portable electronic devices (PEDs).

1.2 This AC is not mandatory and does not constitute a regulation. This AC describes an acceptable means, but not the only means, to demonstrate aircraft tolerance to PEDs. However, if you use the means described in this AC, you must follow it entirely. The term "must" is used to indicate mandatory requirements when following the guidance in this AC. The terms "should" and "recommend" are used when following the guidance is recommended but not required to comply with this AC.

2 AUDIENCE.

We wrote this AC for aircraft manufacturers and modifiers who want to design and demonstrate that their aircraft can tolerate passengers and flightcrew using PEDs without adverse electromagnetic interference to aircraft systems.

3 CANCELLATION.

This AC cancels AC 20-164, dated March 15, 2010.

4 RTCA/DO-307A.

4.1 Scope of RTCA DO-307A.

RTCA/DO-307A establishes aircraft system immunity criteria and test methods for designing and demonstrating aircraft tolerance to potential electromagnetic interference from passenger and flightcrew PEDs. PEDs may be transmitting or non-transmitting

devices, and include mobile phones, wireless radio-frequency (RF) network devices such as tablet computers, DVD players, and laptop computers.

4.2 Changes to RTCA DO-307A.

RTCA/DO-307A ensures consistency with the existing High Intensity Radiated Fields (HIRF) requirements and to incorporate industry lessons learned during application of the existing requirements in DO-307. The revisions clarified the requirements leading to determining whether an aircraft is PED tolerant.

The revisions to DO-307 were based on engineering assessments of the existing PED tolerance requirements and their relationship to existing HIRF regulations. The revisions also provided guidance on configuration control of modifications to previously PED tolerant certificated aircraft.

4.3 Use of RTCA DO-307A Guidance.

Use of the aircraft design standards in RTCA/DO-307A allows the aircraft to be tolerant to adverse interference from PEDs, whether through intentional or inadvertent use. RTCA/DO-307A includes separate aircraft design standards for transmitting and non-transmitting PEDs. Use of these standards may facilitate operator approval for both transmitting and non-transmitting PED operation on a particular aircraft model. The demonstrated aircraft tolerance to potential electromagnetic interference is not restricted to a particular type of PED.

5 AC 91.21-1C AND RTCA/DO-363.

The AC removes RTCA/DO-294C, *Guidance on Allowing Transmitting Portable Electronic Devices*, dated December 16, 2008, and adds AC 91.21-1C, *Use of Portable Electronic Devices Aboard Aircraft*, and RTCA/DO-363, *Guidance for the Development of Portable Electronic Devices (PED) Tolerance for Civil Aircraft*, dated December 15, 2016 for guidance used by aircraft operators.

AC 91.21-1C provides aircraft owners, operators, and the public with information and guidance for assistance in compliance with Title 14 of the Code of Federal Regulations (14 CFR) §§ 91.21, 121.306, 125.204, and 135.144.

RTCA/DO-363 provides specific recommendations for aircraft operators, aircraft manufacturers, equipment manufacturers, and maintenance service providers in how to establish an aircraft as PED tolerant and how to sustain the PED tolerance throughout the aircraft's lifecycle.

6 HOW TO OBTAIN FAA APPROVAL OF A PED-TOLERANT AIRCRAFT DESIGN.

6.1 The regulations in 14 CFR parts 91, 121, 125 and 135 govern the use of PEDs on aircraft, and make the aircraft operator responsible for determining if PED use is acceptable.

6.2 Aircraft PED tolerance demonstrated by the type certification applicant can help the aircraft operator in showing compliance with 14 CFR §§ 91.21, 121.306, 125.204, and 135.144. The type certification applicant may submit data of aircraft PED tolerance in accordance with RTCA/DO-307A for approval by the responsible FAA aircraft certification office (ACO). The type certification applicant should reference compliance with 14 CFR § 25.1309(a), 27.1309(a) or 29.1309(a), which requires the applicant to demonstrate that the aircraft's equipment, systems, and installations must be designed to ensure they perform their intended functions under any foreseeable operating conditions. Pursuant to 14 CFR parts 25, 27, and 29, the FAA considers the RF environment created by the operation of PEDs within the aircraft as a foreseeable operating condition. Applicants demonstrating PED tolerance for part 23 airplanes should reference compliance with 14 CFR 23.2500(a)(2) to specify the environmental limits associated with PED tolerance.

6.3 When the type certification applicant intends to demonstrate PED tolerance in accordance with this AC, the applicant must demonstrate aircraft PED tolerance to intentional transmissions (section 3 of RTCA/DO-307A), and spurious emissions (section 4 of RTCA/DO-307A).

6.4 When the type certification applicant intends to demonstrate PED tolerance in accordance with this AC, the applicant must provide appropriate instructions regarding any operational limitations on the use of PEDs and the PED tolerance of the aircraft (see section 5 of RTCA/DO-307A). To comply with 14 CFR § 25.1581, 27.1581, 29.1581 or 23.1581, these limitations must be documented in the Airplane/Rotorcraft Flight Manual (or Supplement).

Any continued airworthiness instructions required to maintain the level of tolerance should be specified in the instructions for continuing airworthiness (see section 5 of RTCA/DO-307A).

7 REFERENCED DOCUMENTS.

The ACs referenced in this document refer to the current revisions.

The industry documents referenced in this AC refer to the current revisions and amendments or regulatory authority-accepted revisions and amendments.

7.1 Order copies of the RTCA documents referenced in this AC from RTCA Inc., 1150 18th Street NW, Suite 910, Washington, DC 20036. Telephone (202) 833-9339, fax (202) 833-9434. You also can order copies online at www.rtca.org.

7.2 Order copies of 14 CFR parts from the Superintendent of Documents, Government Printing Office, PO Box 37154, Pittsburgh PA 15250-7954. Telephone (202) 512-1800, fax (202) 512-2250. You also may order copies online at www.access.gpo.gov.

7.3 You can find a current list of advisory circulars at http://www.faa.gov/regulations_policies/advisory_circulars/.

If you have any suggestions for improvements or changes, you may use the template provided at the end of this AC.

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Appendix. Advisory Circular Feedback Information

If you find an error in this AC, have recommendations for improving it, or have suggestions for new items/subjects to be added, you may let us know by (1) complete the form online at https://ksn2.faa.gov/avs/dfs/Pages/Home.aspx or (2) emailing this form to 9-AWA-AVS-AIR-DMO@faa.gov

Subject: AC 20-164A Date: _____

Please check all appropriate line items:

☐ An error (procedural or typographical) has been noted in paragraph _____ on page _____.

☐ Recommend paragraph _____ on page _____ be changed as follows:

☐ In a future change to this AC, please cover the following subject:
(Briefly describe what you want added.)

☐ Other comments:

☐ I would like to discuss the above. Please contact me.

Submitted by: _____ Date: _____