

[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 91, 121, 125 and 135

Docket No. FAA-2012-0752

Passenger Use of Portable Electronic Devices On Board Aircraft

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of policy; request for comments.

SUMMARY: The FAA seeks comments on current policy, guidance, and procedures that aircraft operators (ranging from pilots of general aviation aircraft up to and including air carrier certificate holders at the major airlines) use when determining if passenger use of portable electronic devices (PEDs) may be allowed during any phase of flight on their aircraft. Current FAA regulations generally prohibit the use of all PEDs during flight, with the exception of portable voice recorders, hearing aids, heart pacemakers, and electric shavers. These regulations also provide an exception for any other PED that the aircraft operator has determined will not cause interference with the navigation or communication systems on the aircraft. To better effectuate the safety purposes of these regulations, this notice requests comments about key areas of policy and guidance that are used by aircraft operators when making these determinations. It also requests comments about other technical challenges for addressing the problems associated with determining if and when PEDs can be used. The desired outcome of this solicitation is to have sufficient information to allow operators to better assess whether more widespread use of PEDs during flight is appropriate, while maintaining the highest levels of safety to passengers and aircraft. The Agency stresses that the existing regulations allow the operator to authorize the

use of PEDs, and that no specific FAA approval is required. The aircraft operator is responsible for assuring that the interference from PEDs does not pose a flight risk. Once all the comments have been collected, the FAA intends to establish an Aviation Rulemaking Committee (ARC) to review the comments and provide recommendations that might permit the more widespread use of PEDs during flight while maintaining the highest levels of safety for the passengers and aircraft. The FCC will be a key partner in this activity working collaboratively with the FAA, airlines and the manufacturers to explore broader use of PEDS in flight.

DATES: Written comments must be received on or before [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: Send comments identified by docket number FAA-2012-0752 using any of the following methods:

- **Email:** Submit your comments via email to PEDcomment@faa.gov.
- **Federal eRulemaking Portal:** Go to <http://www.regulations.gov> and follow the online instructions for sending your comments electronically.
- **Mail:** Send comments to Docket Operations, M-30; U.S. Department of Transportation (DOT), 1200 New Jersey Avenue, SE, Room W12-140, West Building Ground Floor, Washington, DC 20590-0001.
- **Hand Delivery or Courier:** Take comments to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.
- **Fax:** Fax comments to Docket Operations at 202-493-2251.

Privacy: The FAA will post all comments it receives, without change, to <http://www.regulations.gov>, including any personal information the commenter provides. Using

the search function of the docket web site, anyone can find and read the electronic form of all comments received into any FAA dockets, including the name of the individual sending the comment (or signing the comment for an association, business, labor union, etc.). DOT's complete Privacy Act Statement can be found in the FEDERAL REGISTER published on April 11, 2000 (65 FR 19477-19478), as well as at <http://DocketsInfo.dot.gov>.

Docket: Background documents or comments received may be read at <http://www.regulations.gov> at any time. Follow the online instructions for accessing the docket or contact Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: For questions concerning this action, contact Timothy W. Shaver, Avionics Maintenance Branch, Flight Standards Service, AFS-360, Federal Aviation Administration, 800 Independence Avenue SW, Washington, DC 20591; telephone (202) 385-4292; facsimile (202) 385-6474; e-mail tim.shaver@faa.gov.

SUPPLEMENTARY INFORMATION

We are reviewing the policies, guidance, and procedures that establish the methods and criteria aircraft operators use to determine if they can allow PED usage during flight. The FAA has long recognized that PEDs have the potential for causing interference with aircraft navigation or communication systems. Title 14, Code of Federal Regulations (14 CFR) §§ 91.21, 121.306, 125.204, and 135.144 establish the requirements prohibiting the use of PEDs without the authorization of the aircraft operator.

The FAA's first published rulemaking¹ to address this issue was in 1966. That rulemaking was prompted after studies of PED interference conducted between 1958 to 1961 concluded that portable frequency modulation (FM) radio receivers caused interference to navigation systems such as very high frequency (VHF) Omni Range (VOR) navigation systems.

During that rulemaking process, the FAA received comments on the subject of FAA involvement in the authorization of use of PEDs. The public expressed concerns that authorization of devices not specifically excepted in the rule (e.g., portable voice recorders, hearing aids, heart pacemakers, and electric shavers) would subject operators to a considerable amount of "red tape." In response to those comments, the FAA concluded that the aircraft operators were best suited to make the determination of which PEDs would not cause interference with the navigation or communication system on their aircraft. The FAA also recognized that for it to place requirements upon itself to conduct or verify tests of every conceivable PED, as an alternative to a determination made by the operator, would thereby place an excessive and unnecessary burden on the agency.

The potential for aircraft interference depends on the aircraft and its electrical and electronic systems, as well as the type of PED being used. Prior to fly-by-wire flight controls, the primary concern was the susceptibility of sensitive aircraft communication and navigation radio receivers to spurious radio frequency emissions from PEDs. Many of these aircraft using this older technology are still in service and are as susceptible today to interference as they were when they first entered service. When aircraft included fly-by-wire controls and electronic displays, the susceptibility of these aircraft systems also became a concern. The FAA defined requirements for high-intensity radiated fields (HIRF) that provide assurance that newer aircraft with such systems have sufficient protection to continue to operate safely when exposed to

¹ 14 CFR 91.19, Docket No. 7247; Amdt 91-35 (later superseded by §§ 91.21, 121.306, 125.204, and 135.144).

spurious emissions² of PEDs and intentional transmissions³ from transmitting PEDs. While the highly critical fly-by-wire controls and electronic displays were designed and certified to withstand the fields from transmitting PEDs, all aircraft electrical and electronic systems were not designed to withstand these fields. These newer aircraft still have sensitive navigation, communication, and surveillance radio receivers that may be susceptible at certain frequencies to spurious radio frequency emissions from PEDs.

PEDs have changed considerably in the past few decades and output a wide variety of signals. Some devices do not transmit or receive any signals but generate low-power, radio frequency emissions. Other PEDs, such as e-readers, are only active in this manner during the short time that a page is being changed. Of greater concern are intentional transmissions from PEDs. Most portable electronic devices have internet connectivity that includes transmitting and receiving signals wirelessly using radio waves, such as Wi-Fi,⁴ Bluetooth,⁵ and various other cellular technologies. These devices transmit high-powered emissions and can generate spurious signals at undesired frequencies, particularly if the device is damaged.

Avionics equipment has also undergone significant changes. When the regulations were first established, communication and navigations systems were basic systems. In today's avionics, there are various systems—global positioning, traffic collision and avoidance, transponder, automatic flight guidance and control, and many other advanced avionics systems—that depend on signals transmitted from the ground, other aircraft, and satellites for proper operation. In addition, there are advanced flight management systems that use these avionics as

² A spurious emission is any radio frequency not deliberately created or transmitted.

³ Intentional transmission is the transmission of signals through free space by electromagnetic waves on specific radio frequencies that are used to communicate information between devices.

⁴ Wi-Fi is defined as "wireless local area network (WLAN) products that are based on the Institute of Electrical and Electronics Engineers' (IEEE) 802.11 standards." Wi-Fi is a trademark of the Wi-Fi Alliance.

⁵ Bluetooth is managed by the Bluetooth Special Interest Group (SIG). The SIG is the body that oversees the development of Bluetooth standards and the licensing of the Bluetooth technologies and trademarks to manufacturers. The SIG is a privately held, not-for-profit trade association founded in September 1998.

a critical component for performing precision operational procedures. Many of these systems are also essential to realize the capabilities and operational improvements envisioned in the Next Generation airspace system. As such, harmful interference from PEDs cannot be tolerated.

Under FAA regulation, the aircraft operator is responsible for determining which PEDs may be used by the passengers and during which phase of flight this utilization may occur. The aircraft operator is best suited to make the determination of which PEDs would not cause interference with the navigation or communication system on its aircraft. The operators' PED policy determines what types of devices may be used on board their aircraft and during which phase(s) of flight. The responsibility for enforcing an aircraft operator's PED policy typically falls on the cabin crew. On occasion, enforcement of a commercial airline's PED policy results in a conflict between a flight attendant and a passenger. Noncompliance with crewmember safety instructions on the use of PEDs has resulted in passengers being removed from an aircraft and, in some cases, has caused in-flight diversions. The FAA provides oversight of aircraft operators to ensure that they have established and are currently following robust PED-allowance procedures.

Policy and Guidance

As aircraft and consumer electronics evolved, the FAA recognized that the industry needed assistance to keep up with the challenges of determining if devices would interfere with the aircraft navigation or communication systems. In 1958, at the FAA's request, the first RTCA, Inc., (previously Radio Technical Commission for Aeronautics) documents⁶ were written

⁶ RTCA is a private, not-for-profit corporation that functions as a Federal Advisory Committee for the FAA. It develops consensus-based recommendations regarding communications, navigation, surveillance, and air traffic management (CNS/ATM) system issues. See FAA Order 1110.77T, RTCA Inc. (utilized as an Advisory Committee) (Apr. 1, 2011). The following are RTCA recommendations and guidance documents regarding PEDS: DO-307, *Aircraft Design and Certification for Portable Electronic Device (PED) Tolerance*, issued 10-11-07, and Change 1, issued 12-16-08. Prepared by SC-202.

to help airlines make the PED allowance determination. Since that time, the FAA has requested three other activities; the most recent concluded in 2008. The current guidelines to assist aircraft operators in developing their PED policy are in Advisory Circular (AC) 91-21-1B, *Use of Portable Electronic Devices Aboard Aircraft*, dated August 25, 2006, which references industry-developed guidelines identified in RTCA/DO-233 and RTCA/DO-294.

These joint industry-government committees studied the risks associated with PED usage and are the basis for the FAA's guidance today. For instance, based on these studies, FAA has recommended that operators allowing passenger use of PEDs do so only during non-critical phases of flight and prohibit PED use during takeoff and landing. See AC 91-21-1B. While these recommendations are non-binding, most commercial airlines allow the use of non-transmitting PEDs in flight after the aircraft has reached a safe altitude, and those airlines continue to allow PED usage until near the end of the flight.

The FAA has also published AC 20-164, *Designing and Demonstrating Aircraft Tolerance to Portable Electronic Devices*. This AC is based on RTCA/DO-307, *Aircraft Design and Certification for Portable Electronic Device (PED) Tolerance*, dated October 11, 2007. Further, AC 20-164 provides guidance to demonstrate aircraft electrical and electronic system tolerance to the use of PEDs. This approach allows the aircraft designers to build in protections to help prevent interference to navigation or communication systems.

PEDs Today

DO-294C, *Guidance on Allowing Transmitting Portable Electronic Devices (T-PEDs) on Aircraft*, issued 12-16-08. Prepared by SC-202.

DO-233, *Portable Electronic Devices Carried on Board Aircraft*, issued 8-20-96. Prepared by SC-177. Errata Issued 8-18-99

DO-199, *Potential Interference to Aircraft Electronic Equipment from Devices Carried Aboard*, issued 9-16-88. Prepared by SC-156. Supersedes DO-119.

DO-119, *Interference To Aircraft Electronic Equipment From Devices Carried Aboard*, issued 9-16-88. Prepared by SC-88.

Smart phones, personal computers, and wireless technology have become ingrained in peoples' day-to-day lives. Passengers not only use these devices to remain connected to their work, family, and friends, but also to read books, play games, and accomplish many of their day-to-day tasks. This has naturally led to the passengers' desire to use PEDs from the time they board an aircraft until they exit the aircraft at their destination. In some cases, a transmitting radio is embedded in a PED so that the operation of the transmitter is not apparent to the user. Many of these devices incorporate transmitters such as Bluetooth, Wi-Fi, and cellular phone modems, which may operate without specific actions from the passenger.⁷

While FAA regulations allow aircraft operators to demonstrate when and which PEDs can be safely used, few aircraft operators have allowed use of devices during critical phases of flight (e.g., takeoff and landing). Recognizing that some passengers may wish to use their devices throughout a flight, the FAA is requesting comments regarding the FAA's policies, guidance, and procedures that aircraft operators use to determine whether to allow a particular PED for usage during flight.

Request for Information

Considerations for Comment

The FAA is interested in obtaining comments related to the use of PEDs on aircraft from the viewpoints of aircraft operators, passengers, and other stakeholders. We are soliciting comments on the following:

- Aircraft operators' concerns, both technical and operational;
- Flight attendants' and pilots' concerns;
- Security concerns;

⁷ This notice does not address flightcrew member use of PEDs during flight. Section 44732 of Title 49 of the United States Code generally prohibits flightcrew member use of PEDs on the flightdeck while the aircraft is being operated.

- Manufacturers and designers of PEDs;
- Passenger perspectives; and
- How the FAA can support the aviation industry in considering how to allow

greater use of PEDs.

The FAA has identified the following specific areas for comments.

1) Procedures and methods for operators to allow the use of PEDs. Guidance on the procedures and methods that an operator can use to determine allowance of PEDs is published in AC 91-21-1B. This AC references the industry-developed guidelines of RTCA/DO-233 and RTCA/DO-294C. Those guidelines address testing and analysis procedures for advanced avionics system interference from both transmitting and non-transmitting PEDs.

- What processes and methods are aircraft operators currently using to evaluate PED technology interference?
- How can those procedures and methods be improved?
- Is additional FAA guidance and policy needed?

One concept is for operators to improve the sharing of test and compatibility data, so that the same compatibility testing could be leveraged to support many aircraft operators.

Data concerning PED and aircraft compatibility could be used by the operators to analyze incidents involving PED interference.

- Should the industry develop data sharing for this purpose?

2) Reliability of aircraft systems. Future aircraft could be manufactured to be immune to the PED environment. To support commercial aircraft operators' authorization of PED

use, the FAA has issued AC 20-164 describing criteria for aircraft manufacturers and modifiers to establish PED-tolerance for new and existing aircraft.

- Is it necessary to establish aircraft certification regulations to require new aircraft to be PED-tolerant?

In addition, many aircraft systems have already qualified for operation in high intensity radiated field environments.

- How can these demonstrations best be leveraged to help an operator allow the use of PEDs?

3) Aircraft Immunity to PED Interference. Some aircraft manufacturers and avionics equipment manufacturers have already demonstrated PED and aircraft system compatibility.

- Should aircraft manufacturers and avionics equipment manufacturers provide documentation of aircraft PED tolerance, aircraft systems that meet RF susceptibility requirements, interference path loss, etc., to the operators to support the operator's PED allowance determination?
- Should it be mandatory that aircraft manufacturers and modifiers provide this information to the operators for new and modified aircraft?

4) Promote aircraft-compatible PED transmissions. The transmissions from PEDs vary widely, making it very difficult for an aircraft operator to discriminate between PEDs that may be acceptable and those that may not.

- Could the consumer electronics industry develop standards for aircraft-friendly PEDs, or aircraft-compatible modes of operation, that would reduce the risk of

interference to aircraft systems by defining maximum emissions in designated bands?

5) Passenger perspectives on use of PEDs. Increased access and usage of PEDs may distract passengers during crewmember safety briefings and instructions. In addition, PED usage may have an adverse impact on flight and cabin crew responsibilities and duties. In 2005, the FCC⁸ solicited comments on the potential to expand the use of cellular phones in flight and received responses from passengers concerned about the use of cell phones by other passengers. One of the main concerns expressed by the public comment was the fear of passenger disruptions caused by cell phone use in a crowded public conveyance.

- If some PEDs are found to be compatible with aircraft systems, should there be restrictions on the use of PEDs for other reasons?
- Should voice communications using other technologies such as voice over IP be limited or restricted?
- Should aircraft operators be required to publish their PED policies?

6) PED article retention risk considerations. Personal belongings must be stowed for take-off, approach and landing, to reduce the risk of injury from projectiles and to ensure rapid egress in the event of an emergency. Some PEDs are large enough to be of concern for egress, while smaller handheld devices may have risks comparable to a small book.

- If some PEDs are found to be compatible with aircraft systems, should requirements to stow PEDs for takeoff, approach, landing and abnormal conditions exist nonetheless to prevent personal injury?

⁸ Federal Communications Commission's Notice of Proposed Rulemaking (NPRM), FCC 04-288, in WT Docket No. 04-435, adopted December 15, 2004, and released February 15, 2005.

7) Active monitoring for harmful interference. A handheld device or installed system could be used by the crewmembers to detect harmful interference from PEDs. This could allow the crewmembers to identify problems and instruct passengers to disable devices when they generate harmful signals.

- Should the FAA consider working with industry to develop standards for an active PED monitoring system?

8) Technical Challenges.

- What are the technical, operation, and regulatory challenges commercial aircraft operators face in expanding their PED usage policy?
- What are the technical challenges the aircraft manufacturers, modifiers, and avionics equipment manufacturers see with further PED usage allowance?
- What data and support can they provide to commercial aircraft operators to address these technical challenges?

9) Operational Challenges.

- What are the operational, safety and security challenges and concerns associated with expanding PED usage policy?
- What is needed to alleviate those concerns?

Again, this information must be submitted by **[\[insert date 60 days from publication in the Federal Register\]](#)**.

Comments Invited

The FAA invites interested persons to submit written comments, data, or views. The agency also invites comments relating to the economic, environmental, energy, or federalism impacts that might result from changes in our current policy. The most helpful comments

reference a specific area of concern, explain the reason for any recommended change, and include supporting data. To ensure the docket does not contain duplicate comments, commenters should send only one copy of written comments, or if comments are filed electronically, commenters should submit only one time.

The FAA will file in the docket a summary of all comments it receives. The FAA will consider all comments it receives on or before the closing date for comments. The FAA will consider comments filed after the comment period has closed if it is possible to do so without incurring expense or delay.

Proprietary or Confidential Business Information: Commenters should not file proprietary or confidential business information in the docket. Such information must be sent or delivered directly to the person identified in the FOR FURTHER INFORMATION CONTACT section of this document, and marked as proprietary or confidential. If submitting information on a disk or CD ROM, mark the outside of the disk or CD ROM as proprietary or confidential, and identify electronically within the disk or CD ROM the specific information that is proprietary or confidential.

Under 14 CFR 11.35(b), if the FAA is aware of proprietary information filed with a comment, the Agency does not place it in the docket. It is held in a separate file to which the public does not have access, and the FAA places a note in the docket that it has received it. If the FAA receives a request to examine or copy this information, it treats it as any other request under the Freedom of Information Act (5 U.S.C. 552). The FAA processes such a request under Department of Transportation procedures found in 49 CFR part 7.

Issued in Washington, DC on August 28, 2012.

Susan Cabler,

Aircraft Engineering Division