PEDs and Cell Phones

The Basics

Portable electronic devices (PEDs) include a wide variety of (primarily battery-powered) equipment that might be brought on board aircraft by passengers or crew. The range of devices includes those that do not intentionally transmit radio-frequency (RF) signals, such as compact disk players and calculators. It also includes devices that intentionally transmit RF (e.g., cell phones and other wireless-enabled devices such as personal digital assistants or PDAs); such devices are often called transmitting PEDs, or T-PEDs.

The use of PEDs and T-PEDs on board aircraft creates several significant technical and operational air safety issues. In the United States, the Federal Aviation Administration (FAA) regulates the use of PEDs on aircraft through regulations including Sections 91.21 and 121.306, which prohibit the use of PEDs aboard aircraft unless the operator or certificate holder verify that such use will not interfere with the aircraft’s communications and navigation systems. In particular, the FAA is concerned with the potential for PEDs to interfere with aircraft communications and navigation equipment. Section 91.21 of the FAA rules (supplemented by Advisory Circular AC91.21-1B) prohibits the operation of all PEDs, including cellular phones, onboard an aircraft unless the operator of the aircraft has determined that operation of the PED will not cause interference with the navigation or communication system of the aircraft on which the device is to be used.

In March 2003, RTCA, Inc. formed a special committee at the request of the FAA to present an up-to-date evaluation of the use of PEDs on board civil aircraft, with emphasis on T-PEDs. This committee, known as Special Committee 202 (SC-202), includes representatives from consumer electronic device manufacturers, avionics manufacturers, aircraft manufacturers, airlines, aircraft operators, pilot and flight attendant associations including AFA-CWA, regulatory agencies, and related industry associations. The committee works closely with other industry groups such as the Consumer Electronics Association. With the October 2004 publication of its Phase 1 report, Guidance on Allowing Transmitting Portable Electronic Devices (T-PEDs) on Aircraft (RTCA document DO-294), SC-202 has developed testing procedures to assess the risk of interference for particular PEDs onboard aircraft, and operational procedures for mitigating operational (human factors) impacts. In Phase 2, a longer-term PED technology assessment, the committee focused on emerging PED technologies, for example ultra-wideband devices or pico-cells for telephone use on board aircraft. The final report - DO-294B, Guidance on Allowing Transmitting Portable Electronic Devices (T-PEDs) on Aircraft, was issued December 13, 2006. On October 11, 2007, the committee published a second guidance document, which is intended to mitigate identified PED risks for "new" aircraft design and certification, entitled DO-307, Aircraft Design and Certification for Portable Electronic Device (PED) Tolerance. AFA also supported SC-202 and the CEA in drafting recommended practice CEA-CEB18, which “sets forth a series of provisions … to determine transmit and operational status of transmitting portable electronic devices … to aid in managing their use in sensitive electronic environments.”

The U.S. Federal Communications Commission (FCC) also regulates some types of intentionally transmitting PEDs on aircraft. In 1991, the FCC adopted a prohibition on using 800 MHz cellular phones while airborne. This rule, Section 22.925, prevents the airborne use of cellular phones carried onboard by
passengers or crew members, as well as use of cellular equipment that might be installed permanently, on both private and commercial aircraft. As explained in a 2004/5 FCC proposed rulemaking, this “ban was adopted to guard against the threat of harmful interference from airborne use of cellular phones to terrestrial cellular networks. In a regular terrestrial call, a cellular handset usually communicates through the nearest cell site that can serve it. The farther the signal from the handset travels, the weaker it becomes as its energy spreads out and is attenuated by terrain and obstacles, such as buildings, and is blocked by the curvature of the earth. Consequently, a handset signal is normally too weak to cause co-channel interference at other, more distant, cell sites, and this allows the same frequency to be used by those cell sites to carry cellular calls from other handsets. This principle, called frequency re-use, is the fundamental characteristic of cellular system design that leads to efficient spectrum use. By contrast, if a cellular call were to be made from a handset on an airborne aircraft, the handset signal could be strong enough to cause co-channel interference at multiple cell sites. This is because, even though the airborne handset signal becomes weaker as its energy is spread out, unlike the terrestrial case, it is not attenuated by terrain and obstacles, and it is not blocked by the curvature of the earth. Thus, the signal from an airborne handset may remain sufficiently strong to cause harmful interference or other undesirable effects (e.g., a large increase in noise) at cell sites other than the one that is in communication with the airborne handset.”

In addition to FAA and FCC restrictions on PEDs, the Pipeline and Hazardous Materials Safety Administration (PHMSA) of the U.S. Department of Transportation on January 1, 2008 issued a new rule for passengers traveling with lithium batteries in air travel, which no longer allows loose lithium batteries in checked baggage. From the PHMSA press release: “Lithium batteries are considered hazardous materials because they can overheat and ignite under certain conditions. Safety testing conducted by the FAA found that current aircraft cargo fire suppression system would not be capable of suppressing a fire if a shipment of non-rechargeable lithium batteries were ignited in flight. This rule aims to reduce the risk of fires involving lithium batteries in the cabin of passenger aircraft.” In combination with this new rule, the FAA Office of Security and Hazardous Materials has published Frequently Asked Questions on Batteries Carried by Airline Passengers, and has available a list of Battery and Battery-Powered Device Incidents Since 1991 Reported to FAA. FAA is continuing to review appropriate methods for extinguishing lithium battery fires.

AFA Activity and Hot Topics

On December 15, 2004, the FCC issued a Notice of Proposed Rulemaking (NPRM) to evaluate whether their ban on use of cellular phones on airborne aircraft should be relaxed or lifted. (There are two versions of this NPRM; one is a long version on the FCC website, the other is a somewhat condensed, official version that was published in the Federal Register.) Because of concerns related to possible cell phone interference effects and the operational problems that would arise from widespread use by passengers of such devices on board airplanes in flight, AFA objected to this FCC action, and took the following steps in response:

On January 10, 2005, AFA wrote a letter to former FCC Chairman Michael Powell requesting that the NPRM be withdrawn.

On May 26, 2005, AFA submitted written comments to the FCC WT docket number 04-435, requesting that the FCC and the FAA maintain their respective bans on the use of cellular telephones on airborne aircraft to protect national security, public safety and passenger privacy. In these comments, AFA noted with approval comments filed by the Departments of Justice and Homeland Security and the Federal Bureau of Investigation. The threat to national security posed by unauthorized use of cellular technology was made clear in these comments: “The uniqueness of service to and from an aircraft in flight presents the possibility that terrorists and other criminals could use air-to-ground communications systems to coordinate an attack (e.g., a hijacking).”
On July 12, 2005, AFA International President Pat Friend testified, along with other industry and government representatives, at a hearing of the Aviation Subcommittee of the U.S. House of Representatives Committee on Transportation and Infrastructure, entitled “Cell Phones On Commercial Aircraft - A Nuisance Or Necessity”. The comments by all participants are a useful summary of varying perspectives on the safety and security impacts that might result from airborne cell phone use.

AFA and CWA notified our members through several email alerts of the issues related to the FCC NPRM. In April 2007, the FCC proceeding was terminated, with the Commission noting that the “comments filed in this proceeding provide insufficient technical information that would allow the Commission to assess whether the airborne use of cellular phones may occur without causing harmful interference to terrestrial networks.”

On August 31, 2012, the FAA released a Notice in the Federal Register (docket number FAA-2012-0752) seeking comments from aircraft operators, passengers, and other stakeholders regarding policies, guidance, and procedures that aircraft operators use to allow PED usage. This Notice also requested comments about other technical challenges associated with PED usage, as well as comments relating to economic, environmental, and other impacts that might result from changes in current policies. AFA submitted comments that summarized findings from a brief online survey of AFA safety leaders and responded to specific issues raised in the Notice.

On November 8, 2012, FAA Administrator Michael Huerta chartered an Aviation Rulemaking Committee (ARC) to provide input regarding passenger use of PEDs on board aircraft during any phase of flight. The PED ARC charter, released to the public on January 7, 2013, tasked the committee to review comments received from the public concerning the guidance, policies and regulations that address PED usage. Prior to the public release of the charter, AFA accepted an invitation to participate on the ARC; the FAA subsequently released a full membership roster on January 28, 2013. The ARC charter expired July 31, 2013, but was extended to September 30, 2013 by the FAA Administrator. The final ARC report was published on September 30, 2013. The report contained 29 specific recommendations (with one dissenting recommendation) to the FAA, industry, and travelers that, if followed, would allow for the safe expansion of in-flight PED use. On October 31, 2013, the FAA issued a press release that disclosed the ARC’s report to the public and announced guidance that operators could use to expand in-flight passenger use of PEDs. Within days, several operators, including Delta and JetBlue, announced new expanded use policies.

Between February 28 and April 7, 2014, AFA conducted a survey of members to determine the views of line Flight Attendants regarding the new PED policies and their effects on in-flight cabin safety. A summary of the survey results are available here.

On December 12, 2013, the FCC held an open-to-the-public meeting to discuss (among other things) “Expanding Access to Mobile Wireless Services Onboard Aircraft” and consider “a Notice of Proposed Rulemaking to revise outdated rules and provide airlines with the ability to permit passengers to use mobile wireless services via onboard airborne access systems.” Ultimately, the proposed rule was passed by the Commission by a 3-2 vote. The proposal, similar to the one it had published ten years earlier, would allow equipment to be installed on aircraft that would facilitate in-flight cell phone use. AFA filed comments arguing against this proposal by the initial comment deadline of February 14, 2014 to the FCC docket, as did many member Flight Attendants. On March 10, 2014, the FCC extended the deadline for reply comments (rebuttals to the initial series of comments) to May 16, 2014, to allow additional time for “parties to more thoroughly address the technical issues raised in the Notice and in the record.”

In conjunction with this FCC rulemaking proposal, and following an intense public outcry against the possibility of voice calls being allowed in-flight, the Department of Transportation (DOT) announced that
it would seek “public comment on whether it should propose a rule to ban voice communications on passengers’ mobile wireless devices on flights within, to and from the United States.” Once again, AFA filed comments voicing support for a proposed ban, arguing that the safety and security of our nation’s aviation system must not be compromised. Reviewing the comments, it was clear that about 98% of the individual commenters who filed comments to the docket were supportive of a ban.

References to News Articles


FCC ban on in-flight cellphone calls may be lifted, by Andrea Chang, Los Angeles Times, November 21, 2013.


McCaskill to Introduce Bill to Expand In-Flight Use of PEDs, by Woodrow Bellamy III, Aviation Today, March 11, 2013


Internet calls spur clash over talking in the air, by Bart Jansen, USA Today, November 7, 2012

U.S. airlines in no rush to allow in-flight cellphone use, by Hugo Martín, Los Angeles Times, October 3, 2012

In-flight cell phone use studied, but not taking flight, by Adam Snider and Burgess Everett, Politico, September 5, 2012

Cell phones still fiercely opposed on planes, by Tom Belden, Philadelphia Inquirer, April 27, 2008

Reps want to fly the silent skies, by Michael Collins, Scripps Howard News Service, April 17, 2008

Skies becoming another wireless hot spot, by GERRY SHIH, Cox News Service, February 11, 2008

Airline Passengers Can Bring Batteries Aboard, After All, by Elena Malykhina, InformationWeek, January 17, 2008

Plenty of obstacles remain to cell phone use on planes, by Marilyn Geewax, Cox News Service, July 15, 2005

Lawmakers line up against in-flight cell phones, by Barbara De Lollis, USA TODAY, July 17, 2005

Bipartisan Opposition Voiced Against Allowing Use Of Cell Phones On Commercial Aircraft, U.S. House Committee on Transportation and Infrastructure, July 14, 2005
Proposal to lift cell-phone ban on planes catches flak, by Martin J. Moylan, Pioneer Press, March 23, 2005

More Information

Consumer Electronics Association

Federal Aviation Administration

Industry Group Begins to Study Portable Electronics Use, FAA News Release, January 15, 2013: “Government and industry experts including representatives from the mobile technology and aviation manufacturing industries, pilot and flight attendant groups, and airlines, kicked off their first meeting today to study portable electronic devices (PEDs).”

FAA Fact Sheet: Get the Facts on Cell Phone Use

DOT/FAA/AR-06/38, Flammability Assessment of Bulk-Packed, Rechargeable Lithium-Ion Cells in Transport Category Aircraft, Harry Webster: Documents the findings of a series of tests conducted to determine the flammability characteristics of rechargeable lithium-ion cells and the dangers associated with shipping them in bulk form on commercial transport category aircraft.

DOT/FAA/AR-04/26, Flammability Assessment of Bulk-Packed, Nonrechargeable Lithium Primary Batteries in Transport Category Aircraft, Harry Webster: Documents the findings of a series of tests conducted to determine the flammability characteristics of primary lithium batteries and the dangers associated with shipping them in bulk form on commercial transport category aircraft.

Federal Communications Commission

RTCA, Inc.

UK Civil Aviation Authority (CAA) CAP 756 Portable Electronic Device Generated Electro-magnetic Fields on board a Large Transport Aeroplane, November 30, 2005

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