Will cell phones ever soar?

by Kathryn Balint

Airplanes are the next frontier for the wireless industry, and a new technical report could make it more likely that the U.S. government will rescind the cell phone ban on commercial flights.

Recently, Dubai-based airline Emirates announced plans to become the world's first air carrier to allow passengers to make in-flight cell phone calls. The airline, which obtained approval from air safety and telecommunications regulators in 25 countries in Europe, the Middle East and Asia, expects to allow usage on one of its Boeing 777s on a route in early February.

CELL PHONES FUTURE - Dubai-based Emirates airline will be the first airline to allow in-flight cell phone calls, beginning in February on a route using one of its Boeing 777s. CNS Photo by courtesy of Emirates.The Federal Aviation Administration and the Federal Communications Commission ban in-flight cell phone calls on U.S.-registered aircraft or in U.S. airspace.

The FAA is worried that stray signals from the phones and other electronic devices could interfere with a plane's navigation and communications, while the FCC is concerned that midair cellular calls could wreak havoc with cell phone calls on the ground.

The Radio Technical Commission for Aeronautics, a private organization that the FAA relies on for technical information, has finished a nearly four-year study of potential interference from in-air use of cell phones, Wi-Fi transmitters in laptops and other electronic devices.

The 400-page report, completed in December tells airlines how to test for such interference, bringing the wireless industry closer to ensuring that cell phones are safe to use on planes.

Most commercial airlines offer phones built into seat backs that are specifically intended and approved for

use in flight. But passengers complain about the high cost of those phones; calls can run as high as $10 a minute. Some in the wireless industry think airline passengers would rather use their own cell phones and are exploring ways to make that happen, such as adding cellular antennas on airplanes. If personal cell phones were approved for use on planes, it is likely there would be an additional charge for in-flight calls.

The RTCA report does not advocate the use of cell phones on planes, but rather details what tests airlines should conduct to determine whether a plane is at risk of interference from cell phones or other electronic devices, said Dave Carson, co-chairman of the RTCA committee on portable electronic devices.

"If the airline says, 'We're not sure if there's a concern,' then the report describes how you would go about doing a test that would show specifically if you have interference," said Carson, a Boeing engineer.

Carson said he thinks any potential interference issues can be solved.

The RTCA is a private, nonprofit corporation that serves as a federal advisory committee on communications, navigation, surveillance and other aviation systems.

The RTCA's portable electronic devices committee includes representatives from the airline and wireless industries, such as US Airways, Cingular Wireless, Northwest Airlines, Motorola and Qualcomm.

The FAA, which also has a representative on the committee, will review the final report and recommendations to determine how they might be applied, the agency said. The FAA has not received the final report, agency spokesman Ian Gregor said.

The committee is working on recommendations for commercial airplane manufacturers on how to limit or

prevent interference from passengers' electronic devices. That report is expected to be completed by July, Carson said.

The RTCA's reports ultimately could lead to the FAA's allowing in-flight cell phone use. Still, an airline would have to show the agency that each make and model of aircraft is safe from interference, said Gregor said.

"Proving noninterference could be a big challenge for airlines," he said.

The FAA allows certain electronic devices - laptop computers, handheld video game devices, MP3 players and even cell phones whose wireless capabilities are off - to be used after a plane reaches an altitude of 10,000 feet and if an airline has proved that the device does not interfere with safe operation of the aircraft. The agency said that at lower altitudes, any interference could be more of a safety hazard as the crew focuses on takeoffs and landings.

The FAA said a cell phone signal differs from other portable electronic emissions because it is strong enough to be received at distances far from the user. While cell phones and other portable electronics do not operate on the same frequencies as an airplane's communications equipment, they can emit unintentional signals.

"The issue tends to be what were called spurious emissions," Carson said. "They're not intentional. They're artifacts of the way the radio creates a signal."

POTENTIAL DANGERS

The emissions can travel through the plane's windows to make contact with the communication and

navigation antennas, mounted on the outside of the aircraft.

Stray signals can radiate energy that gets into the plane's wiring and travels to its communications receiver or onboard computers to connect indirectly.

The unintentional emissions can radiate energy that directly makes contact with the onboard computers or communications receiver.

The question is whether those emissions affect a plane's systems, making it unsafe to fly. There is no real proof that they do. Aviation experts have long believed at least one or two passengers aboard every commercial flight inadvertently leave cell phones on, yet cell phones have not been proved to have led to any crashes.

Airlines shared with the RTCA committee a number of anecdotal reports of interference, but the interference could not be repeated in controlled tests, Carson said.

Lufthansa, for example, shared its experiences with the committee in trying to verify reports of interference from portable electronic devices.

"They'd say that a 'Game Boy or cell phone was turned on, and when we turned it off, the interference seemed to go away,' " Carson said. "In almost all cases when they chased down those reports, either the interference could not be repeated or they found something else that was the cause of the problem.

"The bottom line is that you need an assessment to determine how the interference is getting in. It's a bad idea to just blame portable electronic devices."

Paul Guckian, vice president of engineering for Qualcomm in San Diego and a member of the RTCA committee, said the committee's research has shown that cell phones are not the sole issue.

"The fact is that a cell phone or notebook computer or PlayStation Portable - any of those electronic devices - have the equivalent potential to interfere with the aircraft communication system," Guckian said.

Boeing and other commercial manufacturers are already taking steps to shield an aircraft's equipment from unintentional emissions, which should make the next generation of planes less susceptible to the stray signals from cell phones and other handheld devices.

Even if the issues with stray emissions are resolved, the FCC is concerned that signals from airplanes confuse cellular networks.

On the ground, a cell phone regularly connects to the nearest cellular antenna to let the system know where it is and that it is available to receive calls. As the cell phone moves, say, in a vehicle, the signal is handed off from one antenna to the next. A cell phone thousands of feet overhead could contact numerous antennas, potentially disrupting calls and confusing the system.

When the FCC said in 2004 that it was considering lifting its ban on the use of cell phones on airplanes, it received more than 7,800 comments from the public. The commission has not made a decision and has not set a date to do so.

The Cellular Telecommunications Industry Association said it is not advocating the use of cell phones aboard planes. Spokesman Joe Ferren said if the FAA and FCC decide that it is safe, then the trade group would defer

to the airlines.

"Our view is it would be up to the airlines," he said. "It's not something we're pushing or advocating."

Qualcomm, a developer of wireless technology and maker of chips that power cell phones, has been working on the cell phone issue from several angles.

In July 2004, the San Diego company and American Airlines conducted a successful "proof of concept" test using cell phones aboard an MD-80 aircraft over Dallas. The two-hour test, done with the permission of the FCC and the FAA, involved phones using Qualcomm's patented CDMA - code division multiple access - technology. Calls were made over Sprint's network.

To eliminate the problem of a phone contacting numerous cell towers on the ground, Qualcomm installed a small cell phone antenna - called a pico cell - on the plane that linked the calls to a satellite system and then to the Sprint network on the ground.

As many as 15 calls at once were made, and no interference with the aircraft's equipment was found, said Guckian, the Qualcomm vice president. From 2003 to 2004, Qualcomm used a corporate business jet to measure cell phone activity over 10 flights. Qualcomm collected logs from the phones during all phases of flight. The data were used to help the company understand the behavior of CDMA cell phones and to establish power levels necessary to prevent interference with ground networks.

Qualcomm conducted research with Boeing beginning in 2004 to see if a pico cell system on a plane would interfere with wireless networks on the ground. Guckian said that CDMA cell phones, which can operate at lower power levels than rival GSM phones, showed no interference with terrestrial networks. He said GSM phones showed a greater possibility of interference with networks on the ground.

Guckian said he believes cell phones will be allowed on airplanes - someday.

"I think it may happen under much more controlled scenarios," he said. "You'll see some trials going on, but in terms of a widespread deployment, that's several years away."

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