

Unlicensed Communications Products and the FCC

Deploy Carefully — the Network You Save Could be Your Own

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During the past two decades, the Federal Communications Commission has made substantial strides in encouraging the deployment of unlicensed communications networks, that is, low-power radio frequency (RF) services that are operated without FCC licenses. Since the 1980s, the FCC has opened large swaths of spectrum for unlicensed operations in several frequency bands, including the 915 MHz, 1920 MHz, 2.4 GHz, 5.2 GHz, 5.8 GHz, 24 GHz, and 60 GHz bands. The FCC is currently conducting a rulemaking proceeding to propose unlicensed operations in certain analog television frequencies that will be vacated as part of the digital TV conversion scheduled to be completed in 2009.

The availability of spectrum for unlicensed operations has generated significant markets for communications equipment, particularly wireless broadband devices. In the second quarter of 2006, worldwide sales of WiFi and Bluetooth enabled wireless local area network (WLAN) devices totaled more than \$700 million, while sales of WiMAX equipment topped \$173 million. Leading market research firms predict that by 2009 worldwide annual sales of unlicensed WLAN and WiMAX devices will exceed \$3.8 billion and \$3.2 billion, respectively.

Benefits of Unlicensed Operations: FCC Restrictions

These figures show that the benefits of unlicensed communications are widely recognized. Unlicensed network operators avoid substantial upfront licensing costs, and can quickly implement service without waiting for consent of the FCC. Moreover, unlicensed operations are not limited to any geographic area; transmitters can be set up or moved to any area of the country as needed.

While operators of unlicensed networks enjoy substantial discretion, their equipment is subject to FCC regulation. Each component of a communications network that emits RF energy must, among other things, comply with the technical requirements of Part 15 of the FCC's rules.

Section 302(b) of the Federal Communications Act prohibits the manufacturing, importation, marketing, or use of any RF device that does not comply with FCC regulations. The FCC's policies regarding unlicensed devices are that they: (a) may not cause harmful interference to other operations; and (b) must accept any interference received. These policies are reflected in rules requiring unlicensed devices to meet its RF emissions limitations, power restrictions, frequency selection, and other requirements.

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Manufacturers, importers, vendors, and users of unlicensed equipment need to understand pertinent FCC rules and the ramifications of failing to comply with them. If an unlicensed device violates the FCC's rules, the responsible party is subject to FCC disciplinary actions. FCC sanctions for noncompliant devices could include substantial fines and a prohibition against marketing, importing, or operating the devices in the U.S.

Three Different Radiators: Know the Difference

The FCC divides unlicensed devices into three categories, and regulates each in a different manner. Part 15 of the FCC's rules contains distinct technical requirements for each device category and each frequency band in which a device operates. Part 15 also lists restricted frequencies, and along with Part 2 of the FCC's rules, delineates the authorization and operational rules for unlicensed devices.

The first category is intentional radiator. An intentional radiator is a device that intentionally generates and emits RF energy by radiation or induction, i.e., a low-power transmitter. Examples include WLAN and WiMAX transceivers, and monitoring and tracking devices.

The second category is unintentional radiator. An unintentional radiator is a device that intentionally generates RF energy for use within the device, or that sends RF signals by conduction to associated equipment via connecting wiring. Examples include personal computers, CPU boards, cable system terminal devices, and carrier current systems.

Unintentional radiators using digital technology are sub-categorized as either Class A or Class B digital devices. Class A devices (e.g., carrier current components) are restricted to commercial uses. Class B devices (e.g., personal computers and their components) may be used in both commercial and residential environments.

The third category is incidental radiator. An incidental radiator is a device that generates RF energy during the course of its operation, but is not intentionally designed to emit or radiate such energy. Examples include basic battery chargers, electric motors and mechanical light switches.

FCC's Golden Rule: Authorize Your Equipment Before Marketing

Intentional and unintentional radiators are subject to the FCC's authorization requirements; with limited exceptions they must be authorized prior to marketing in the U.S. The FCC defines marketing to include selling, leasing, advertising, importing, shipping, or distribution of a device, or offering the device for sale or lease.

The FCC has three different authorization processes: (a) certification; (b) verification; and (c) declaration of conformity. The particular authorization method depends on the interference potential of the specific device. Most intentional radiators are authorized by certification. Certification entails filing an application with the FCC containing, among other things, a technical report containing RF testing results, and an analysis showing that the device complies with FCC rules. The FCC evaluates the application; if it determines the device meets its regulations,

it issues a certification. The party responsible for FCC compliance of certified devices is the party who filed for certification; typically the manufacturer or importer.

Verification is a self-authorization procedure applicable to certain types of unintentional radiators, including all Class A digital devices and some Class B digital devices. Verification requires the responsible party – the manufacturer or importer – to test a device to ensure it complies with the FCC's rules, and retain all the records of the testing procedure. Unlike certification, no proof of compliance need be submitted to the FCC concerning a verified device, unless the FCC specifically requests it.

Many Class B digital devices, including personal computers and CPU boards, are authorized by a declaration of conformity. The declaration of conformity procedure is similar to verification, except that: (a) the responsible party must supply a compliance information statement with each device sold, listing the responsible party and declaring compliance with the FCC's rules; and (b) the testing lab used must be accredited by industry standard organizations. The party responsible for FCC compliance regarding these devices is either the manufacturer, importer, or, if the device was assembled from individual component parts, the assembler.

Temporary Exceptions to the Golden Rule

While the FCC generally prohibits the marketing of unlicensed devices prior to authorization, there are exceptions for businesses that seek to introduce new products into the U.S., as long as the devices are authorized before they are introduced into general commerce. For example, the FCC's rules provide an exemption for sales contracts between manufacturers and wholesalers or retailers where delivery is contingent upon authorization, or to produce new products manufactured in accordance with the FCC's regulations.

The FCC also permits a pre-authorized device to be advertised, displayed and operated at trade shows or exhibitions if a notice stating that the device is not yet authorized is inserted in the ad or placed near the device. Pre-authorized devices may be offered for sale to businesses and scientific or medical users if the prospective buyer is notified in writing at the time of the offer that the device will comply with the appropriate FCC rules before delivery. Pre-authorized devices may also be operated for compliance testing purposes.

Post-Authorization Responsibilities

FCC compliance does not end with authorization. Once an unlicensed device has entered the marketplace, the responsible party remains liable for any FCC rule violation involving that device. If, for example, a manufacturer designs and markets a WLAN system with components that exceed the FCC's RF emissions limits, it is the manufacturer, not the vendor, who is subject to disciplinary action and sanctions for the rule violation. This scenario changes when another entity modifies a device to change the RF, frequency, or power characteristics. In that case, the entity performing the modification becomes the responsible party.

FCC Enforcement Activity

While vendors and users of noncompliant devices are generally not responsible for

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FCC violations, such breaches can have negative consequences for them. The FCC can order vendors to take all illegal devices out of their stores and distribution channels, and require operators of such equipment to shut their networks down.

Lately, the FCC has been vigorously enforcing its RF equipment rules. During the past several months, the FCC has initiated dozens of investigations against entities suspected of marketing noncompliant devices, and imposed penalties that resulted in monetary forfeitures and lost revenues to the entities that could no longer market their unlicensed devices.

For example, the FCC recently issued eight citations to different sellers of the same unauthorized device, ordering them to immediately cease selling the device or risk penalties including fines up to \$11,000 for each day the device is sold. In other instances, the FCC forced manufacturers of noncompliant devices to take their devices off the market and pay fines ranging from \$30,000 to \$75,000. The FCC has also issued public notices commanding retailers to clear their shelves of unlicensed devices that emitted RF energy in excess of the legal limits.

Protect Yourself and Your Network: Know the Rules

With the ample availability of suitable spectrum and new products coming on the market, opportunities abound for the deployment of profitable unlicensed wireless networks. As recent FCC enforcement history illustrates, however, it is imperative that manufacturers, importers, vendors and users of unlicensed devices familiarize themselves with the FCC's rules, and put in place procedures to ensure that their devices are authorized and operate in compliance with these regulations. FCC compliance is critical to ensure that robust communications networks are rapidly deployed without delays, interruptions, or FCC enforcement actions.

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