13-49



January 10, 2013

Rashmi Doshi
Chief, Laboratory Division
Office of Engineering and Technology
Federal Communications Commission
Washington, D.C. 20554

Re: Frequency separation proposals for unlicensed devices operating in the 5600-5650 MHz band

Dear Dr. Doshi:

Attached is a copy of a document that industry informally shared with the Office of Engineering and Technology staff in September 2011. The document, a product of discussions among Cisco Systems, Cambium Networks, Aruba Networks and Motorola Solutions, proposes possible outcomes to allow continued unlicensed device use of the weather radar band.

Please feel free to associate the document into the record of the forthcoming 5 GHz proceeding.

Respectfully submitted,

Cisco Systems, Inc.

By: Mary L. Brown
Director, Government Affairs
Cisco Systems, Inc.
601 Pennsylvania Ave NW North
Suite 900
Washington DC 20004
marybrow@cisco.com
202.354.2923

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# Equipment manufacturers
# 5 GHz Frequency Separation Proposals

The purpose of this document is to resolve the issues of frequency separation in the 5470-5725 MHz band. Industry proposed rules are intended to apply to this band only.

## 1 Considerations:

Industry approached our discussions from the perspective that the FCC preferred to solve the issues presented by the TDWRs using some combination of equipment certification rule changes and enforcement. Industry did not discuss other approaches, such as light licensing. If other approaches are used, many of the proposals that follow would need to be adjusted or eliminated.

With respect to the following proposals, industry offers the following observations:

Manufacturers cannot control bad behavior after devices enter commerce.

Equipment certification cannot completely address the issues raised by non-compliant and/or TDWR-interfering 5 GHz devices. FCC enforcement will still be needed.

Conclusion –Target proposals for equipment certification to address as much of the problem as possible & focus on what manufacturers can control and/or strongly influence.

## 2 Use indoor/outdoor distinction as an initial filter to distinguish equipment most likely to raise a concern

- Exempt indoor from frequency separation requirements
- Manufacturer declares whether "indoor" or "outdoor" (part of its application, contained in its grant, product labeling & manual instructions)

- If indoor is declared, must include in its manual a list of antennas (see below) and must include this language or similar language in manual-
    - "Putting antenna outside is illegal and punishable by FCC fines"
    - "Installation subject to random FCC audit"
    - Plus characterization of what "outdoor" means (per below)
- If outdoor declared, must include in its manual a list of antennas (see below) and description of what "outdoor" includes (see below), unless exempt due to low power (item 2)
- Declaration is based on the following:
    - INDOOR: designed to be installed, or operated within the interior of a building or structure
    - OUTDOOR: designed to be installed, or operated in the open air
    - FCC to publish KDB to industry to discuss "outdoor" and provide the following additional characterizations to guide users. Suggest that manufacturers put the following language in user manuals for both indoor and outdoor devices.
        - "Devices or installations that have any of the following attributes are to be considered outdoor:
            - Placed in an enclosure that facilitates the use outdoors (example: a NEMA enclosure)
            - Devices that are designed with an IPx5 rating or greater and intended for both indoor /outdoor use.
            - Placed in an interior location with the purpose of radiating outdoors or outside the walls of the building or structure (examples: attic, near a window, breezeway, covered walkway, open air stadium, partially enclosed stadium, loading dock)
            - Devices or equipment that can be easily moved or carried from indoors to outdoors ( examples - hand held devices, battery powered access points)"
    - If there is any concern, a Labhelp.gov request should be submitted to resolve the classification of a particular device or installation.

## 3 EIRP for devices categorized outdoor should be a second filter to distinguish those devices with a greater potential to cause harm.

### 3.1 200 mW EIRP and below:

- no further action to address frequency separation
    - Almost all battery operated personal portable devices are 200 mW EIRP and below

### 3.2 200-500 mW EIRP :

- no further action for personal portable; for other devices, if the antenna is mounted to exceed 10 meters height above the ground level, device must register with database if within 35 km of TDWR and must be professionally installed
    - User manuals to explain requirements as applicable

### 3.3 Above 500 mW EIRP:

- if within 35 km of TDWR, mandatory database registration; requires professional install

#### 3.3.1 Define professional install criteria:

- FCC rule or KDB and repeat in user manual as applicable.
    - The 'Profession Installer' must have a basic understanding of RF theory
    - Be able to calculate EIRP for a given transmitter configuration, i.e. , Conducted Output Power - Cabling Losses - Mechanical Connection Losses + Antenna Gain = Radiated Output Power (should be equal to or lower than the Maximum Power as listed on the FCC Grant for a transmitter).
    - Be familiar with both the mechanical and software tools necessary to configure and adjust the given transmitter being installed
    - Understand basic FCC regulations for the permissible location and installation requirements of various radio products being installed
    - Understand basic antenna operational theory and standard industry antenna installation practices

- Certified by local authorities to install electrical devices or certified by an accrediting agency such as iNARTE, etc.

## 4 Antenna Gain requirements can be more thoroughly spelled out in applications and grants, so that variance is a clear violation

- Apply following to both indoor and outdoor
- Systems tested with minimum gain antenna option for DFS and maximum antenna gain option for EIRP – FCC, manuals to state that operation with antennas outside this range is illegal, even with professional installation
- Publish in grant and in user manual (and websites) the list of approved antenna types and maximum gain value (not just model numbers)

## 5 Ability to turn channels off can be an important tool for professional installers

- Revise the uniform spreading rule 15.407(g)(2)

## 6 Other issues discussed

- Background scanning (adjacent channel)
  - Not supported by chipset manufacturers
  - No near term chipset solution
  - Could be a long term option
- "Handshake" of targeted equipment to database
  - Requires Internet connectivity, but this is not present on all networks – therefore, not likely to be an effective solution

## 7 Database operation and funding

- Operation
  - Single database
  - Commercial provider selected by WISPA

- Minimum data fields to include: information about directional antenna azimuths
- Government access unrestricted
- Installer/operator can access own data
- FCC requirement – database must be transferable to another vendor should WISPA choose to change vendors
- FCC finding that vendor selected meets the requirements

- Funding
  - Fee on master DFS 5 GHz outdoor devices (if fee payment at time of install, would discourage registration)
  - Applicant for FCC ID must present proof of fee payment to database vendor at time of initial application for application to be found to be complete