

EIRP Limits for PCS Base Stations 2002 Biennial Review Proceeding WT Docket No. 03-264

Presentation to

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by

CTIA – The Wireless Association™

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Equivalent Isotropically Radiated Power (“EIRP”) Limits for PCS Base Stations

- CTIA proposes to supplement current EIRP limits for PCS base stations with ones restated as power spectral density limits. This concept was noticed in the 2002 Biennial Review NPRM. FCC 03-334 para. 18.
- The proposal is technology neutral.
- The proposal is a compromise of proposals previously submitted by CTIA member companies in this proceeding.

Current PCS Base Station EIRP Limits

- Too restrictive
- No longer necessary to prevent PCS operators from transmitting beyond mobile units' capability
- Artificially constrain more modern technologies
 - Prevent deployment of technologies that would increase network efficiency and decrease the cost of deploying service.
 - Prevent deployment of technologies that would achieve coverage over larger areas and improve coverage outdoors, indoor, and in vehicles.

CTIA Proposal

- Modify the rule to allow base stations to transmit at either (1) the current limits, or (2) a comparable power spectral density. A power spectral density limit would facilitate use of new (wideband) technologies that are restricted under the current rule.
- For antenna heights up to 300 meters HAAT, base stations should be limited to the greater of:
 - 1640 watts average EIRP per carrier; or
 - 3280 watts/MHz average EIRP.

CTIA Proposal (cont'd)

- This proposal provides flexibility to deploy new technologies without causing harmful interference to neighboring systems.
- The proposal is consistent with the power spectral densities permitted under current rules, *i.e.*, operation of individual carriers at 1640 watts EIRP:
 - A GSM system with two carriers in 1 MHz can generate a signal with 3280 watts EIRP/MHz
 - A system with three carriers in 1 MHz would generate 4920 watts EIRP/MHz.

CTIA Proposal (cont'd)

- In rural areas, for antenna heights up to 300 meters HAAT, base stations should be limited to the greater of:
 - 3280 watts average EIRP per carrier; or
 - 6560 watts/MHz average EIRP.
- CTIA is not recommending that the per-MHz constraints for antennas above 300 meters exceed the current constraints.
- The absolute 100 and 200 watt base station transmitter output power limits in sections 24.232(a) and (b) should be eliminated.

CTIA Proposal (cont'd)

- The Commission should mirror these rule changes in section 27.50(d)(1) of its Advanced Wireless Service rules to ensure regulatory parity.
- The Commission should clarify that the per-carrier limit applies to frequency-hopping systems and that OFDM systems must meet the appropriate watts/MHz limit.
- For systems that use discontinuous transmission, CTIA proposes that the watts/MHz limit apply during the time when transmitting.

Proposed Rule Changes

§ 24.232 Power and antenna height limits.

- (a) Base stations are limited to **the greater** of 1640 watts **average peak** equivalent isotropically radiated power (EIRP) **per carrier or 3280 watts/MHz average EIRP** with an antenna height up to 300 meters HAAT, except as described in paragraph (b) below. See Sec. 24.53 for HAAT calculation method. Base station antenna heights may exceed 300 meters with a corresponding reduction in power; see Table 1 of this section. ~~In no case may the peak output power of a base station transmitter exceed 100 watts.~~ The service area boundary limit and microwave protection criteria specified in Sec. 24.236 and Sec. 24.237 apply.

Proposed Rule Changes

§ 24.232 Power and antenna height limits.

Table 1 – Reduced Power for Base Station Antenna Heights Over 300 Meters

HAAT in meters	Maximum EIRP watts	Maximum EIRP watts/MHz
≤300	1640	3280
≤500	1070	1070
≤1000	490	490
≤1500	270	270
≤2000	160	160

Proposed Rule Changes

§ 24.232 Power and antenna height limits.

- (b) Base stations that are located in counties with population densities of 100 persons or fewer per square mile, based upon the most recently available population statistics from the Bureau of the Census, are limited to **the greater of 3280 watts average peak** equivalent isotropically radiated power (EIRP) **per carrier of 6560 watts/MHz average EIRP** with an antenna height up to 300 meters HAAT; See Sec. 24.53 for HAAT calculation method. Base station antenna heights may exceed 300 meters with a corresponding reduction in power; see Table 2 of this section. ~~In no case may the peak output power of a base station transmitter exceed 200 watts.~~ The service area boundary limit and microwave protection criteria specified in Sec. 24.236 and Sec. 24.237 apply. Operation under this paragraph must be coordinated in advance with all PCS licensees within 120 kilometers (75 miles) of the base station and is limited to base stations located more than 120 kilometers (75 miles) from the Canadian border and more than 75 kilometers (45 miles) from the Mexican border.

Proposed Rule Changes

§ 24.232 Power and antenna height limits.

Table 2 – Reduced Power for Base Station Antenna Heights Over 300 Meters

HAAT in meters	Maximum EIRP watts	Maximum EIRP watts/MHz
≤300	3280	6560
≤500	2140	2140
≤1000	980	980
≤1500	540	540
≤2000	320	320

Proposed Rule Changes

§ 24.232 Power and antenna height limits.

- (c) Mobile/portable stations are limited to 2 watts EIRP peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.
- (d) Peak **or average** transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak **or average** measurement for the emission in question over the full bandwidth of the channel. **Systems employing discontinuous transmission technologies on one or more carriers shall be measured with all carriers in active transmission.**