

that operate using PSD (as permitted under § 22.913), the licensee must use a predictive propagation model that is appropriate for the service provided, taking into account terrain and local conditions. The SAB and CGSA boundary must be defined in terms of distances from the cell site to the 32 dBuV/m contour along the eight cardinal radials, with points in other azimuthal directions determined by the method set forth in paragraph (a)(6) of this section. The distances used must be representative of the coverage within the eight cardinal radials.

(2) An application for major modification of the CGSA under this paragraph (c) must include, as an exhibit, a depiction of the CGSA accompanied by one or more supporting propagation studies using methods appropriate for the 800–900 MHz frequency range, including all supporting data and calculations, and/or by extensive field strength measurement data. For the purpose of such submissions, Cellular service is considered to be provided in all areas, including “dead spots,” between the transmitter location and the locus of points where the predicted or measured median field strength finally drops to 32 dBuV/m (*i.e.*, does not exceed 32 dBuV/m further out). If, after consideration of such submissions, the FCC finds that adjustment to a CGSA is warranted, the FCC may grant the application.

(d) *Protection afforded.* Cellular systems are entitled to protection only within the CGSA (as determined in accordance with this section) from co-channel and first-adjacent channel interference (*see* § 22.983). Licensees must cooperate in resolving co-channel and first-adjacent channel interference by changing channels used at specific cells or by other technical means.

(e) [Reserved]

[59 FR 59507, Nov. 17, 1994, as amended at 59 FR 59954, Nov. 21, 1994; 63 FR 68951, Dec. 14, 1998; 67 FR 9609, Mar. 4, 2002; 67 FR 77191, Dec. 17, 2002; 68 FR 42295, July 17, 2003; 79 FR 72151, Dec. 5, 2014; 82 FR 17582, Apr. 12, 2017]

§ 22.912 Service area boundary extensions.

This section contains rules governing service area boundary (SAB) extensions. SAB extensions are areas (cal-

culated using the methodology of § 22.911) that extend outside of the licensee’s Cellular Geographic Service Area (CGSA) boundary into Unserved Area or into the CGSA of a neighboring co-channel licensee. Service within SAB extensions is not protected from interference or capture under § 22.911(d) unless and until the area within the SAB extension becomes part of the CGSA in compliance with all applicable rules.

(a) *Extensions into Unserved Area.* Subject to paragraph (c) of this section, the licensee of a Cellular system may, at any time, extend its SAB into Unserved Area and provide service on a secondary basis only, provided that the extension area comprises less than 130 contiguous square kilometers (50 contiguous square miles). If more than one licensee of a Cellular system extends into all or a portion of the same Unserved Area under this section, all such licensees may provide service in such Unserved Area on a shared secondary (unprotected) basis only.

(b) *Contract extensions.* The licensee of any Cellular system may, at any time, enter into a contract with an applicant for, or a licensee of, a Cellular system on the same channel block to allow one or more SAB extensions into its CGSA (not into Unserved Area).

(c) *Gulf of Mexico Service Area.* Land-based Cellular system licensees may not extend their SABs into the Gulf of Mexico Exclusive Zone (GMEZ) absent written contractual consent of the co-channel GMEZ licensee. GMEZ licensees may not extend their SABs into the CGSA of a licensee on the same channel block in an adjacent CMA or the Gulf of Mexico Coastal Zone absent written contractual consent of the co-channel licensee.

[79 FR 72151, Dec. 5, 2014]

§ 22.913 Effective radiated power limits.

Licensees in the Cellular Radiotelephone Service are subject to the effective radiated power (ERP) limits and other requirements in this Section. *See also* § 22.169.

(a) *Maximum ERP.* The ERP of transmitters in the Cellular Radiotelephone Service must not exceed the limits in this section.

(1) Except as described in paragraphs (a)(2), (3), and (4) of this section, the ERP of base stations and repeaters must not exceed—

- (i) 500 watts per emission; or
- (ii) 400 watts/MHz (PSD) per sector.

(2) Except as described in paragraphs (a)(3) and (4) of this section, for systems operating in areas more than 72 kilometers (45 miles) from international borders that:

(i) 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; or

(ii) Extend coverage into Unserved Area on a secondary basis (*see* § 22.949), the ERP of base transmitters and repeaters must not exceed—

- (A) 1000 watts per emission; or
- (B) 800 watts/MHz (PSD) per sector.

(3) Provided that they also comply with paragraphs (b) and (c) of this section, licensees are permitted to operate their base transmitters and repeaters with an ERP greater than 400 watts/MHz (PSD) per sector, up to a maximum ERP of 1000 watts/MHz (PSD) per sector unless they meet the conditions in paragraph (a)(4) of this section.

(4) Provided that they also comply with paragraphs (b) and (c) of this section, licensees of systems operating in areas more than 72 kilometers (45 miles) from international borders that:

(i) 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; or

(ii) Extend coverage into Unserved Area on a secondary basis (*see* § 22.949), are permitted to operate base transmitters and repeaters with an ERP greater than 800 watts/MHz (PSD) per sector, up to a maximum of 2000 watts/MHz (PSD) per sector.

(5) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

(b) *Power flux density (PFD)*. Until May 12, 2024, each Cellular base station that operates at the higher ERP limits permitted under paragraphs (a)(3) and (4) of this section must be designed and deployed so as not to exceed a modeled PFD of 3000 microwatts/m²/MHz over at least 98% of the area within 1 km of

the base station antenna, at 1.6 meters above ground level. To ensure its compliance with this requirement, the licensee must perform predictive modeling of the PFD values within at least 1 km of each base station antenna prior to commencing such operations and, thereafter, prior to making any site modifications that may increase the PFD levels around the base station. The modeling tools must take into consideration terrain and other local conditions and must use good engineering practices for the 800 MHz band.

(c) *Advance notification requirement*. At least 30 days but not more than 90 days prior to activating a base station at the higher ERP limits permitted under paragraphs (a)(3) and (4) of this section, the Cellular licensee must provide written advance notice to any public safety licensee authorized in the frequency range 806–816 MHz/851–861 MHz with a base station located within a radius of 113 km of the Cellular base station to be deployed. The written notice shall be required only one time for each such cell site and is for informational purposes only; the public safety licensees are not afforded the right to accept or reject the activation or to unilaterally require changes in the operating parameters. The written notification must include the base station's location, ERP level, height of the transmitting antenna's center of radiation above ground level, and the time-frame for activation, as well as the Cellular licensee's contact information. Additional information shall be provided by the Cellular licensee upon request of a public safety licensee required to be notified under this paragraph (c). *See also* §§ 22.970 through 22.973.

(d) *Power measurement*. Measurement of the ERP of Cellular base transmitters and repeaters must be made using an average power measurement technique. The peak-to-average ratio (PAR) of the transmission must not exceed 13 dB. Power measurements for base transmitters and repeaters must be made in accordance with either of the following:

(1) A Commission-approved average power technique (*see* FCC Laboratory's Knowledge Database); or

(2) For purposes of this section, peak transmit power must be measured over an 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 measurement for the emission in question over the full bandwidth of the channel.

(e) *Height-power limit.* The ERP of base transmitters must not exceed the amount that would result in an average distance to the service area boundary of 79.1 kilometers (49 miles) for Cellular systems authorized to serve the Gulf of Mexico MSA and 40.2 kilometers (25 miles) for all other Cellular systems. The average distance to the service area boundary is calculated by taking the arithmetic mean of the distances determined using the procedures specified in § 22.911 for the eight cardinal radial directions.

(f) *Exemptions from height-power limit.* Licensees need not comply with the height-power limit in paragraph (e) of this section if either of the following conditions is met:

(1) The proposed operation is coordinated with the licensees of all affected Cellular systems on the same channel block within 121 kilometers (75 miles) and concurrence is obtained; or

(2) The licensee's base transmitter or repeater is operated at the ERP limits (W/MHz) specified above in paragraph (a)(1)(ii), (a)(2)(ii), (a)(3), or (a)(4) of this section.

[82 FR 17582, Apr. 12, 2017]

§ 22.917 Emission limitations for cellular equipment.

The rules in this section govern the spectral characteristics of emissions in the Cellular Radiotelephone Service.

(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

(b) *Measurement procedure.* Compliance with these rules is based on the use of measurement instrumentation

employing a reference bandwidth as follows:

(1) In the spectrum below 1 GHz, instrumentation should employ a reference bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy, provided that the measured power is integrated over the full required reference bandwidth (*i.e.*, 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

(2) In the spectrum above 1 GHz, instrumentation should employ a reference bandwidth of 1 MHz.

(c) *Alternative out of band emission limit.* Licensees in this service may establish an alternative out of band emission limit to be used at specified band edge(s) in specified geographical areas, in lieu of that set forth in this section, pursuant to a private contractual arrangement of all affected licensees and applicants. In this event, each party to such contract shall maintain a copy of the contract in their station files and disclose it to prospective assignees or transferees and, upon request, to the FCC.

(d) *Interference caused by out of band emissions.* If any emission from a transmitter operating in this service results in interference to users of another radio service, the FCC may require a greater attenuation of that emission than specified in this section.

[67 FR 77191, Dec. 17, 2002, as amended at 82 FR 17583, Apr. 12, 2017]

§ 22.921 [Reserved]

§ 22.923 Cellular system configuration.

Mobile stations communicate with and through base transmitters only. Base transmitters communicate with