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of the Census, with an emission bandwidth of 1 MHz or less are limited to 3280 watts equivalent isotropically radiated power (EIRP) with an antenna height up to 300 meters HAAT.

(2) 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, with an emission bandwidth greater than 1 MHz are limited to 3280 watts/MHz equivalent isotropically radiated power (EIRP) with an antenna height up to 300 meters HAAT.

(3) Base station antenna heights may exceed 300 meters HAAT with a corresponding reduction in power; *see* Tables 3 and 4 of this section.

(4) The service area boundary limit and microwave protection criteria specified in §§ 24.236 and 24.237 apply.

(5) Operation under this paragraph (b) at power limits greater than permitted under paragraph (a) of this section must be coordinated in advance with all broadband PCS licensees authorized to operate on adjacent frequency blocks 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.

TABLE 3—REDUCED POWER FOR BASE STATION ANTENNA HEIGHTS OVER 300 METERS, WITH EMISSION BANDWIDTH OF 1 MHz OR LESS

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

TABLE 4—REDUCED POWER FOR BASE STATION ANTENNA HEIGHTS OVER 300 METERS, WITH EMISSION BANDWIDTH GREATER THAN 1 MHz

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

(c) Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

(d) Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of § 24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

(e) Peak 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 measurement for the emission in question over the full bandwidth of the channel.

NOTE TO § 24.232: Height above average terrain (HAAT) is to be calculated using the method set forth in § 24.53 of this part.

[73 FR 24183, May 2, 2008]

### § 24.235 Frequency stability.

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

### § 24.236 Field strength limits.

The predicted or measured median field strength at any location on the border of the PCS service area shall not exceed 47 dBuV/m unless the parties agree to a higher field strength.

### § 24.237 Interference protection.

(a) All licensees are required to coordinate their frequency usage with the co-channel or adjacent channel incumbent fixed microwave licensees in the 1850–1990 MHz band. Coordination must occur before initiating operations from any base station. Problems that

arise during the coordination process are to be resolved by the parties to the coordination. Licensees are required to coordinate with all users possibly affected, as determined by appendix I to this subpart E (Appendix E of the Memorandum Opinion and Order, GEN Docket No. 90–314, FCC 94–144; TIA Telecommunications Systems Bulletin 10–F, “Interference Criteria for Microwave Systems,” May 1994, (TSB10–F)); or an alternative method agreed to by the parties.

(b) The results of the coordination process need to be reported to the Commission only if the parties fail to agree. Because broadband PCS licensees are required to protect fixed microwave licensees in the 1850–1990 MHz band, the Commission will be involved in the coordination process only upon complaint of interference from a fixed

microwave licensee. In such a case, the Commission will resolve the issues.

(c) In all other respects, coordination procedures are to follow the requirements of §101.103(d) of this chapter to the extent that these requirements are not inconsistent with those specified in this part.

(d) The licensee must perform an engineering analysis to assure that the proposed facilities will not cause interference to existing OFS stations within the coordination distance specified in Table 3 of a magnitude greater than that specified in the criteria set forth in paragraphs (e) and (f) of this section, unless there is prior agreement with the affected OFS licensee. Interference calculations shall be based on the sum of the power received at the terminals of each microwave receiver from all of the applicant’s current and proposed PCS operations.

TABLE 3—COORDINATION DISTANCES IN KILOMETERS

PCS Base Station Antenna HAAT in Meters													
EIRP(W)	5	10	20	50	100	150	200	250	300	500	1000	1500	2000
0.1 .....	90	93	99	110	122	131	139	146	152	173	210	239	263
0.5 .....	96	100	105	116	128	137	145	152	158	179	216	245	269
1 .....	99	103	108	119	131	140	148	155	161	182	219	248	272
2 .....	120	122	126	133	142	148	154	159	164	184	222	250	274
5 .....	154	157	161	168	177	183	189	194	198	213	241	263	282
10 .....	180	183	187	194	203	210	215	220	225	240	268	291	310
20 .....	206	209	213	221	229	236	242	247	251	267	296	318	337
50 .....	241	244	248	255	264	271	277	282	287	302	331	354	374
100 .....	267	270	274	282	291	297	303	308	313	329	358	382	401
200 .....	293	296	300	308	317	324	330	335	340	356	386	409	436
500 .....	328	331	335	343	352	359	365	370	375	391	421	440	
1000 .....	354	357	361	369	378	385	391	397	402	418			
1200 .....	361	364	368	376	385	392	398	404	409	425			
1640 .....	372	375	379	388	397	404	410	416	421	437			
2400 .....	384	387	391	399	408	415	423	427	431				
3280 .....	396	399	403	412	419	427	435	439	446				

(e) For microwave paths of 25 kilometers or less, interference determinations shall be based on the C/I criteria set forth in TIA Telecommunications Systems Bulletin 10–F, “Interference Criteria for Microwave Systems,” May 1994 (TSB10–F).

(f) For microwave paths longer than 25 kilometers, the interference protection criterion shall be such that the interfering signal will not produce more than 1.0 dB degradation of the practical threshold of the microwave receiver for analog system, or such that the interfering signal will not cause an increase in the bit error rate

(BER) from 10E–6 to 10E–5 for digital systems.

(g) The development of the C/I ratios and interference criteria specified in paragraphs (e) and (f) of this section and the methods employed to compute the interfering power at the microwave receivers shall follow generally acceptable good engineering practices. The procedures described for computing interfering signal levels in (appendix I to this subpart E Appendix E of the Memorandum Opinion and Order, GEN Docket No. 90–314, FCC 94–144) shall be applied. Alternatively, procedures for determining interfering signal levels

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and other criteria as may be developed by the Electronics Industries Association (EIA), the Institute of Electrical and Electronics Engineers, Inc. (IEEE), the American National Standards Institute (ANSI) or any other recognized authority will be acceptable to the Commission.

[59 FR 32854, June 24, 1994, as amended at 61 FR 29691, June 21, 1996; 69 FR 75171, Dec. 15, 2004]

### § 24.238 Emission limitations for Broadband PCS equipment.

The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications 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 resolution bandwidth of 1 MHz or greater. However, 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 the measured power is integrated over the full required measurement bandwidth (*i.e.* 1 MHz 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.

(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 77192, Dec. 17, 2002]

### POLICIES GOVERNING MICROWAVE RELOCATION FROM THE 1850-1990 MHZ BAND

### § 24.239 Cost-sharing requirements for broadband PCS.

Frequencies in the 1850-1990 MHz band listed in § 101.147(c) of this chapter have been allocated for use by PCS. In accordance with procedures specified in §§ 101.69 through 101.81 of this chapter, PCS entities (both licensed and unlicensed) are required to relocate the existing Fixed Microwave Services (FMS) licensees in these bands if interference to the existing FMS operations would occur. All PCS entities who benefit from spectrum clearance by other PCS entities or a voluntarily relocating microwave incumbent, must contribute to such relocation costs. PCS entities may satisfy this requirement by entering into private cost-sharing agreements or agreeing to terms other than those specified in § 24.243. However, PCS entities are required to reimburse other PCS entities or voluntarily relocating microwave incumbents that incur relocation costs and are not parties to the alternative agreement. In addition, parties to a private cost-sharing agreement may seek reimbursement through the clearinghouse (as discussed in § 24.241) from PCS entities that are not parties to the agreement. The cost-sharing plan is in effect during all phases of microwave relocation specified in § 101.69 of this chapter. If a licensee in the Broadband PCS Service enters into a spectrum leasing arrangement (as set forth in part 1, subpart X of this chapter) and the spectrum lessee triggers a cost-sharing obligation,