(d)(1) The operator of an earth station licensed pursuant to paragraph (c) of this section will bear the burden of coordinating with the operator of a co-frequency space station subsequently licensed by the Commission for operation at an orbital location 10° or less from the earth station's target satellite if the co-frequency space station's reception of conforming uplink transmissions is, or would be, adversely affected by the earth station's non-conforming operation. If no agreement is reached, the earth station operator must reduce EIRP density toward that co-frequency space station to a level in conformance with the envelopes specified in paragraph (b) of this section.

(2) The operator of an earth station licensed pursuant to paragraph (c)(1) or (c)(2) of this section must reduce EIRP density to levels at or within those specified in paragraph (b) toward a U.S.-licensed space station receiving in the same uplink band at an angular separation from the earth station's target satellite greater than is required in paragraph (c)(1) of this section, if the co-frequency space station's reception of conforming uplink transmissions is adversely affected by the non-conforming earth station operation, unless the non-conforming operation is permitted under a coordination agreement with the operator of the co-frequency space station.

[72 FR 50030, Aug. 29, 2007, as amended at 79 FR 8324, Feb. 12, 2014; 81 FR 55344, Aug. 18, 2016]

§ 25.224 Protection of receive-only earth stations in the 17/24 GHz BSS.

(a) Notwithstanding § 25.209(c) of this part, receive-only earth stations operating in the 17/24 GHz broadcasting-satellite service can claim no greater protection from interference than they would receive if the equivalent antenna diameter were equal to or greater than 45 cm and the antenna meets the co-polar and cross-polar performance patterns represented by the following set of formulas (adopted in Recommendation ITU–R BO.1213–1, dated November 2005) that are valid for $D/\lambda \geq 11$:

(1) Co-polar pattern:

$$G_{co}(\varphi) = G_{max} - 2.5 \times 10^{-3}\left(\frac{D}{\lambda}\varphi\right)^2 \text{ for } \quad 0 \le \varphi < \varphi_m$$

where:

$$\varphi_m = \frac{\lambda}{D}\sqrt{\frac{G_{max} - G_1}{0.0025}}$$

$$G_{max} = 10\log\left(\eta\left(\frac{\pi D}{\lambda}\right)^2\right)$$

$G_1 = 29 - 25 \log \varphi_r$, and $\varphi_r = 95\frac{\lambda}{D}$

$G_{CO}(\varphi) = G_1$ for $\varphi_m \le \varphi < \varphi_r$

$G_{CO}(\varphi) = 29 - 25 \log \varphi$ for $\varphi_r \le \varphi < \varphi_b$ where $\varphi_b = 10^{(34/25)}$

$G_{CO}(\varphi) = -5$ dBi for $\varphi_b \le \varphi < 70°$

$G_{CO}(\varphi) = 0$ dBi for $70° \le \varphi < 180°$

(2) Cross-polar pattern:

$G_{cross}(\varphi) = G_{max} - 25$ for $0 \le \varphi < 0.25\ \varphi_0$

where:

$$\varphi_0 = 2\frac{\lambda}{D}\sqrt{\frac{3}{0.0025}} = 3 \text{ dB beamwidth}$$

$$G_{cross}(\varphi) = G_{max} - 25 + 8\left(\frac{\varphi - 0.25\ \varphi_0}{0.19\ \varphi_0}\right) \text{ for } 0.25\ \varphi_0 \le \varphi < 0.44\ \varphi_0$$

$G_{cross}(\varphi) = G_{max} - 17$ for $0.44\ \varphi_0 \le \varphi < \varphi_0$

$$G_{cross}(\varphi) = G_{max} - 17 + C\left|\frac{\varphi - \varphi_0}{\varphi_1 - \varphi_0}\right| \text{ for } \varphi_0 \le \varphi < \varphi_1 \text{ where } \varphi_1 = \frac{\varphi_0}{2}\sqrt{10.1875}$$

and $C = 21 - 25 \log(\varphi_1) - (G_{max} - 17)$

$G_{cross}(\varphi) = 21 - 25 \log \varphi$ for $\varphi_1 \le \varphi < \varphi_2$ where $\varphi_2 = 10^{(26/25)}$

$G_{cross}(\varphi) = -5$ dBi for $\varphi_2 \le \varphi < 70°$

$G_{cross}(\varphi) = 0$ dBi for $70° \le \varphi < 180°$

where:

D: equivalent antenna diameter

λ: wavelength expressed in the same unit as the diameter

φ: off-axis angle of the antenna relative to boresight (degrees)

η: antenna efficiency = 0.65

(b) Paragraph (a) of this section does not apply to 17/24 GHz BSS telemetry earth stations. Those earth stations are subject to the antenna performance standards of §25.209(a) and (b) of this part.

[72 FR 50031, Aug. 29, 2007]