

§§ 25.221–25.223

earth station that meets the requirements of §25.209 of this title would be protected from interference.

(4) Notwithstanding paragraph (d)(1)(ii) of this section, a party applying for an earth station license pursuant to this section will not be required to certify that its target satellite operator has reached a coordination agreement with another satellite operator whose satellite is within 6° of orbital separation from its satellite in cases where the off-axis EIRP density level of the proposed earth station operations will be less than or equal to the levels specified by the applicable off-axis EIRP envelope set forth in §25.218 of this chapter in the direction of the part of the geostationary orbit arc within 1° of the nominal orbit location of the adjacent satellite.

(e)–(f) [Reserved]

(g) Applicants filing applications for earth stations pursuant to this section must provide the following information for the Commission’s public notice:

(1) Detailed description of the service to be provided, including frequency bands and satellites to be used. The applicant must identify either the specific satellites with which it plans to operate, or the eastern and western

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boundaries of the geostationary satellite orbit arc it plans to coordinate.

(2) The diameter or equivalent diameter of the antenna.

(3) Proposed power and power density levels.

(4) Identification of any rule or rules for which a waiver is requested.

[70 FR 32256, June 2, 2005, as amended at 72 FR 50030, Aug. 29, 2007; 73 FR 70902, Nov. 24, 2008; 74 FR 57099, Nov. 4, 2009; 78 FR 14927, Mar. 8, 2013; 79 FR 8324, Feb. 12, 2014; 81 FR 55341, Aug. 18, 2016; 83 FR 34491, July 20, 2018; 84 FR 53656, Oct. 8, 2019]

§§ 25.221–25.223 [Reserved]

§ 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 copolar 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:

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

where:

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

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

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

$$\begin{aligned} G_{co}(\varphi) &= G_1 && \text{for } \varphi_m \leq \varphi < \varphi_r \\ G_{co}(\varphi) &= 29 - 25 \log \varphi && \text{for } \varphi_r \leq \varphi < \varphi_b \text{ where } \varphi_b = 10^{(34/25)} \\ G_{co}(\varphi) &= -5 \text{ dBi} && \text{for } \varphi_b \leq \varphi < 70^\circ \\ G_{co}(\varphi) &= 0 \text{ dBi} && \text{for } 70^\circ \leq \varphi < 180^\circ \end{aligned}$$

(2) Cross-polar pattern:

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

where:

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

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

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

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

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

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

$$G_{cross}(\varphi) = -5 \text{ dBi} \text{ for } \varphi_2 \leq \varphi < 70^\circ$$

$$G_{cross}(\varphi) = 0 \text{ dBi} \text{ for } 70^\circ \leq \varphi < 180^\circ$$

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]