

will take into account previous measures by the licensees to mitigate the risk of interference.

[75 FR 45069, Aug. 2, 2010, as amended at 78 FR 9619, Feb. 11, 2013]

**§ 25.264 Requirements to facilitate reverse-band operation in the 17.3–17.8 GHz band of 17/24 GHz BSS and DBS Service space stations.**

(a) Each 17/24 GHz BSS space station applicant or licensee must submit a series of tables or graphs containing predicted off-axis gain data for each antenna that will transmit in the 17.3–17.8 GHz frequency band, in accordance with the following specifications. Using a Cartesian coordinate system wherein the X axis is tangent to the geostationary orbital arc with the positive direction pointing east, *i.e.*, in the direction of travel of the satellite; the Y axis is parallel to a line passing through the geographic north and south poles of the Earth, with the positive direction pointing south; and the Z axis passes through the satellite and the center of the Earth, with the positive direction pointing toward the Earth, the applicant or licensee must provide the predicted transmitting antenna off-axis antenna gain information:

(1) In the X–Z plane, *i.e.*, the plane of the geostationary orbit, over a range of  $\pm 30$  degrees from the positive and negative X axes in increments of 5 degrees or less.

(2) In planes rotated from the X–Z plane about the Z axis, over a range of  $\pm 60$  degrees relative to the equatorial plane, in increments of 10 degrees or less.

(3) In both polarizations.

(4) At a minimum of three measurement frequencies determined with respect to the entire portion of the 17.3–17.8 GHz frequency band over which the space station is designed to transmit: 5 MHz above the lower edge of the band; at the band center frequency; and 5 MHz below the upper edge of the band.

(5) Over a greater angular measurement range, if necessary, to account for any planned spacecraft orientation bias or change in operating orientation relative to the reference coordinate system. The applicant or licensee must

state the reasons for including such additional information.

(6) The predictive gain information must be submitted to the Commission when a license application is filed for a 17/24 GHz BSS space station or within 60 days after completion of critical design review for the space station, whichever occurs later.

(b) A 17/24 GHz BSS space station applicant or licensee must submit power flux density (pfd) calculations based on the predicted gain data submitted in accordance with paragraph (a) of this section, as follows:

(1) The pfd calculations must be provided at the location of all prior-filed U.S. DBS space stations where the applicant's pfd level exceeds the coordination trigger of  $-117$  dBW/m<sup>2</sup>/100 kHz in the 17.3–17.8 GHz band. In this rule, the term prior-filed U.S. DBS space station refers to any co-frequency Direct Broadcast Satellite service space station for which an application was filed with the Commission, or an authorization was granted by the Commission, prior to the filing of the information and certifications required by paragraphs (a) and (b) of this section. The term prior-filed U.S. DBS space station does not include any applications (or authorizations) that have been denied, dismissed, or are otherwise no longer valid. Prior-filed U.S. DBS space stations may include foreign-licensed DBS space stations seeking authority to serve the United States market, but do not include foreign-licensed DBS space stations that have not filed applications with the Commission for market access in the United States.

(2) The pfd calculations must take into account the maximum permitted longitudinal station-keeping tolerance, orbital inclination and orbital eccentricity of both the 17/24 GHz BSS and DBS space stations, and must:

(i) Identify each prior-filed U.S. DBS space station at whose location the coordination threshold pfd level of  $-117$  dBW/m<sup>2</sup>/100 kHz is exceeded; and

(ii) Indicate the extent to which the calculated pfd of the 17/24 GHz space station's transmissions in the 17.3–17.8 GHz band exceed the threshold pfd level of  $-117$  dBW/m<sup>2</sup>/100 kHz at those

prior-filed U.S. DBS space station locations.

(3) If the calculated pfd exceeds the threshold level of  $-117$  dBW/m<sup>2</sup>/100 kHz at the location of any prior-filed U.S. DBS space station, the applicant or licensee must also provide with the pfd calculations a certification that all affected DBS operators acknowledge and do not object to such higher off-axis pfd levels. No such certification is required in cases where the DBS and 17/24 GHz BSS assigned operating frequencies do not overlap.

(4) The information and any certification required by paragraph (b) of this section must be submitted to the Commission when a license application is filed for a 17/24 GHz BSS space station or within 60 days after completion of critical design review for the space station, whichever occurs later. Otherwise, such information and certifications must be submitted to the Commission within 24 months after the grant of an operating license for a 17/24 GHz BSS space station or when the applicant or licensee certifies completion of critical design review, whichever occurs first.

(c) No later than 2 months prior to launch, each 17/24 GHz BSS space station licensee must update the predicted transmitting antenna off-axis gain information provided in accordance with paragraph (a) of this section by submitting measured transmitting antenna off-axis gain information over the angular ranges, measurement frequencies and polarizations specified in paragraphs (a)(1) through (5) of this section. The transmitting antenna off-axis gain information should be measured under conditions as close to flight configuration as possible.

(d) No later than 2 months prior to launch, or when applying for authority to change the location of a 17/24 GHz BSS space station that is already in orbit, each 17/24 GHz BSS space station licensee must provide pfd calculations based on the measured off-axis gain data submitted in accordance with paragraph (c) of this section, as follows:

(1) The pfd calculations must be provided:

(i) At the location of all prior-filed U.S. DBS space stations as defined in

paragraph (b)(1) of this section, where the applicant's pfd level in the 17.3–17.8 GHz band exceeds the coordination trigger of  $-117$  dBW/m<sup>2</sup>/100 kHz; and

(ii) At the location of any subsequently filed U.S. DBS space station where the pfd level in the 17.3–17.8 GHz band calculated on the basis of measured gain data exceeds  $-117$  dBW/m<sup>2</sup>/100 kHz. In this rule, the term subsequently filed U.S. DBS space station refers to any co-frequency Direct Broadcast Satellite service space station proposed in a license application filed with the Commission after the 17/24 GHz BSS operator submitted the predicted data required by paragraphs (a) through (b) of this section but before submission of the measured data required by this paragraph. Subsequently-filed U.S. DBS space stations may include foreign-licensed DBS space stations seeking authority to serve the United States market. The term does not include any applications (or authorizations) that have been denied, dismissed, or are otherwise no longer valid, nor does it include foreign-licensed DBS space stations that have not filed applications with the Commission for market access in the United States.

(2) The pfd calculations must take into account the maximum permitted longitudinal station-keeping tolerance, orbital inclination and orbital eccentricity of both the 17/24 GHz BSS and DBS space stations, and must:

(i) Identify each prior-filed U.S. DBS space station at whose location the coordination threshold pfd level of  $-117$  dBW/m<sup>2</sup>/100 kHz is exceeded; and

(ii) Demonstrate the extent to which the applicant's or licensee's transmissions in the 17.3–17.8 GHz band exceed the threshold pfd level of  $-117$  dBW/m<sup>2</sup>/100 kHz at those prior-filed U.S. DBS space station locations.

(e) If the pfd level calculated from the measured data submitted in accordance with paragraph (d) of this section is in excess of the threshold pfd level of  $-117$  dBW/m<sup>2</sup>/100 kHz:

(1) At the location of any prior-filed U.S. DBS space station as defined in paragraph (b)(1) of this section, then the 17/24 GHz broadcasting-satellite operator must either:

(i) Coordinate its operations that are in excess of the threshold pfd level of  $-117$  dBW/m<sup>2</sup>/100 kHz with the affected prior-filed U.S. DBS space station operator, or

(ii) Adjust its operating parameters so that at the location of the prior-filed U.S. DBS space station, the pfd level of  $-117$  dBW/m<sup>2</sup>/100 kHz is not exceeded.

(2) At the location of any subsequently-filed U.S. DBS space station as defined in paragraph (d)(1) of this section, where the pfd level submitted in accordance with paragraph (d) of this section, is also in excess of the pfd level calculated on the basis of the predicted data submitted in accordance with paragraph (a) of this section that were on file with the Commission at the time the DBS space station application was filed, then the 17/24 GHz broadcasting-satellite operator must either:

(i) Coordinate with the affected subsequently-filed U.S. DBS space station operator all of its operations that are either in excess of the pfd level calculated on the basis of the predicted antenna off-axis gain data, or are in excess of the threshold pfd level of  $-117$  dBW/m<sup>2</sup>/100 kHz, whichever is greater, or

(ii) Adjust its operating parameters so that at the location of the subsequently-filed U.S. DBS space station, either the pfd level calculated on the basis of the predicted off-axis transmitting antenna gain data, or the threshold pfd level of  $-117$  dBW/m<sup>2</sup>/100 kHz, whichever is greater, is not exceeded.

(3) No coordination or adjustment of operating parameters is required in cases where the DBS and 17/24 GHz BSS operating frequencies do not overlap.

(f) The 17/24 GHz BSS applicant or licensee must modify its license, or amend its application, as appropriate, based upon new information:

(1) If the pfd levels submitted in accordance with paragraph (d) of this section, are in excess of those submitted in accordance with paragraph (b) of this section at the location of any prior-filed or subsequently-filed U.S. DBS space station as defined in paragraphs (b)(1) and (d)(1) of this section, or

(2) If the 17/24 GHz BSS operator adjusts its operating parameters in accordance with paragraphs (e)(1)(ii) or (e)(2)(ii) or this section.

(g) Absent an explicit agreement between operators to permit more closely spaced operations, U.S. authorized 17/24 GHz BSS space stations and U.S. authorized DBS space stations with co-frequency assignments may not be licensed to operate at locations separated by less than 0.2 degrees in orbital longitude.

(h) All operational 17/24 GHz BSS space stations must be maintained in geostationary orbits that:

(1) Do not exceed 0.075° of inclination.

(2) Operate with an apogee less than or equal to 35,806 km above the surface of the Earth, and with a perigee greater than or equal to 35,766 km above the surface of the Earth (*i.e.*, an eccentricity of less than  $4.7 \times 10^{-4}$ ).

(i) U.S. authorized DBS networks may claim protection from space path interference arising from the reverse-band operations of U.S. authorized 17/24 GHz BSS networks to the extent that the DBS space station operates within the bounds of inclination and eccentricity listed below. When the geostationary orbit of the DBS space station exceeds these bounds on inclination and eccentricity, it may not claim protection from any additional space path interference arising as a result of its inclined or eccentric operations and may only claim protection as if it were operating within the bounds listed below:

(1) The DBS space station's orbit does not exceed 0.075° of inclination, and

(2) The DBS space station's orbit maintains an apogee less than or equal to 35,806 km above the surface of the Earth, and a perigee greater than or equal to 35,766 km above the surface of the Earth (*i.e.*, an eccentricity of less than  $4.7 \times 10^{-4}$ ).

[76 FR 50431, Aug. 15, 2011, as amended at 81 FR 55348, Aug. 18, 2016]

#### § 25.265 Acceptance of interference in 2000–2020 MHz.

(a) MSS receivers operating in the 2000–2020 MHz band must accept interference from lawful operations in the