

stations to operate in a specified number of orbital planes.

(c) In addition to providing the information specified in §25.114, each non-geostationary satellite orbit applicant shall demonstrate the following:

(1) That the proposed system is capable of providing Fixed-Satellite Service to all locations as far north as 70° North Latitude and as far south as 55° South Latitude for at least 75% of every 24-hour period; and

(2) That the proposed system is capable of providing Fixed-Satellite Service on a continuous basis throughout the fifty states, Puerto Rico and the U.S. Virgin Islands.

(3) [Reserved]

(d) [Reserved]

(e) Prohibition of certain agreements. No license shall be granted to any applicant for a space station in the Fixed-Satellite Service operating in the 20/30 GHz band if that applicant, or any persons or companies controlling or controlled by the applicant, shall acquire or enjoy any right, for the purpose of handling traffic to or from the United States, its territories or possession, to construct or operate space segment or earth stations, or to interchange traffic, which is denied to any other United States company by reason of any concession, contract, understanding, or working arrangement to which the Licensee or any persons or companies controlling or controlled by the Licensee are parties.

(f)(1) [Reserved]

(2) Licensees shall submit to the Commission a yearly report indicating the number of earth stations actually brought into service under its blanket licensing authority. The annual report is due to the Commission no later than the first day of April of each year and shall indicate the deployment figures for the preceding calendar year.

(g) *Protection from interference from terrestrial operation in the 18.3 to 19.3 GHz band.* Fixed-Satellite Service operators are entitled to protection from harmful interference from terrestrial stations operating in this frequency band. See §§21.901(e), 74.502(c), 74.602(g), 78.18(a)(4), and 101.147(r) of this chapter.

(h) *Replacement of Space Stations within the System License Term.* Licensees of NGSO FSS systems in the 18.8–19.3 GHz

and 28.6–29.1 GHz frequency bands authorized through a blanket license pursuant to paragraph (b) of this section need not file separate applications to launch and operate technically identical replacement satellites within the term of the system authorization. However, the licensee shall certify to the Commission, at least thirty days prior to launch of such replacement(s) that:

(1) The licensee intends to launch a space station into the previously-authorized orbit that is technically identical to those authorized in its system authorization and

(2) Launch of this space station will not cause the license to exceed the total number of operating space stations authorized by the Commission.

[62 FR 61456, Nov. 18, 1997, as amended at 65 FR 54171, Sept. 7, 2000; 66 FR 63515, Dec. 7, 2001; 67 FR 39310, June 7, 2002; 68 FR 16966, Apr. 8, 2003; 68 FR 51505, Aug. 27, 2003; 68 FR 59129, Oct. 14, 2003; 70 FR 59277, Oct. 12, 2005; 78 FR 8423, Feb. 6, 2013; 79 FR 8320, Feb. 12, 2014]

**§25.146 Licensing and operating rules for the non-geostationary orbit Fixed-Satellite Service in the 10.7 GHz–14.5 GHz bands.**

(a) A comprehensive technical showing shall be submitted for the proposed non-geostationary satellite orbit Fixed-Satellite Service (NGSO FSS) system in the 10.7–14.5 GHz bands. The technical information shall demonstrate that the proposed NGSO FSS system would not exceed the validation equivalent power flux-density (EPFD) limits as specified in §25.208 (g), (k), and (l) for EPFD<sub>down</sub>, and EPFD<sub>up</sub>. If the technical demonstration exceeds the validation EPFD limits at any test points within the U.S. for domestic service and at any points outside of the U.S. for international service or at any points in the geostationary satellite orbit, as appropriate, the application would be unacceptable for filing and will be returned to the applicant with a brief statement identifying the non-compliance technical demonstration. The technical showing consists of the following:

(1) *Single-entry validation equivalent power flux-density, in the space-to-Earth direction, (EPFD<sub>down</sub>) limits.* (i) Provide a set of power flux-density (PFD) masks, on the surface of the Earth, for each

space station in the NGSO FSS system. The PFD masks shall be generated in accordance with the specification stipulated in the most recent version of ITU-R Recommendation S.1503, “Functional Description to be used in Developing Software Tools for Determining Conformity of Non-GSO FSS Networks with Limits Contained in Article 22 of the Radio Regulations.” In particular, the PFD masks must encompass the power flux-density radiated by the space station regardless of the satellite transmitter power resource allocation and traffic/beam switching strategy that are used at different periods of a NGSO FSS system’s life. The PFD masks shall also be in an electronic form that can be accessed by the computer program specified in paragraph (a)(1)(iii) of this section.

(ii) Identify and describe in detail the assumptions and conditions used in generating the power flux-density masks.

(iii) If a computer program that has been approved by the ITU for determining compliance with the single-entry EPFD<sub>down</sub> validation limits is not yet available, the applicant shall provide a computer program for the single-entry EPFD<sub>down</sub> validation computation, including both the source code and the executable file. This computer program shall be developed in accordance with the specification stipulated in the most recent version of Recommendation ITU-R S.1503. If the applicant uses the ITU approved software, the applicant shall indicate the program name and the version used.

(iv) Identify and describe in detail the necessary input parameters for the execution of the computer program identified in paragraph (a)(1)(iii) of this section.

(v) Provide the result, the cumulative probability distribution function of EPFD, of the execution of the computer program described in paragraph (a)(1)(iii) of this section by using only the input parameters contained in paragraphs (a)(1)(i) and (a)(1)(iv) of this section.

(2) *Single-entry additional operational equivalent power flux-density, in the space-to-Earth direction, (additional operational EPFD<sub>down</sub>) limits.* (i) Provide a set of NGSO FSS earth station max-

imum equivalent isotropically radiated power (EIRP) masks as a function of the off-axis angle generated by an NGSO FSS earth station. The maximum EIRP mask shall be generated in accordance with the specification stipulated in the most recent version of ITU-R Recommendation S.1503. In particular, the results of calculations encompass what would be radiated regardless of the earth station transmitter power resource allocation and traffic/beam switching strategy are used at different periods of an NGSO FSS system’s life. The EIRP masks shall be in an electronic form that can be accessed by the computer program specified in paragraph (a)(2)(iii) of this section.

(ii) Identify and describe in detail the assumptions and conditions used in generating the maximum earth station e.i.r.p. mask.

(iii) If a computer program that has been approved by the ITU for determining compliance with the single-entry EPFD<sub>up</sub> validation limits is not yet available, the applicant shall provide a computer program for the single-entry EPFD<sub>up</sub> validation computation, including both the source code and the executable file. This computer program shall be developed in accordance with the specification stipulated in the most recent version of Recommendation ITU-R S.1503. If the applicant uses the ITU approved software, the applicant shall indicate the program name and the version used.

(iv) Identify and describe in detail the necessary input parameters for the execution of the computer program identified in paragraph (a)(2)(iii) of this section.

(v) Provide the result of the execution of the computer program described in paragraph (a)(2)(iii) of this section by using only the input parameters contained in paragraphs (a)(2)(i) and (a)(2)(iv) of this section.

(b) Ninety days prior to the initiation of service to the public, the NGSO FSS system licensee shall submit a comprehensive technical showing for the non-geostationary satellite orbit Fixed-Satellite Service (NGSO FSS) system in the 10.7–14.5 GHz bands. The technical information shall demonstrate that the NGSO FSS system is

expected not to operate in excess of the additional operational  $EPFD_{down}$  limits and the operational  $EPFD_{down}$  limits as specified in § 25.208(i) and (j), and notes 2 and 3 to Table 1L in § 25.208(l). If the technical demonstration exceeds the additional operational  $EPFD_{down}$  limits or the operational  $EPFD_{down}$  limits at any test points within the United States for domestic service and at any test points outside of the United States for international service, the NGSO FSS system licensee shall not initiate service to the public until the deficiency has been rectified by reducing satellite transmission power or other adjustments. This must be substantiated by subsequent technical showings. The technical showings consist of the following:

(1) *Single-entry additional operational equivalent power flux-density, in the space-to-Earth direction, (additional operational  $EPFD_{down}$ ) limits.* (i) Provide a set of anticipated operational power flux density (PFD) masks, on the surface of the Earth, for each space station in the NGSO FSS system. The anticipated operational PFD masks could be generated by using the method specified in the most recent version of ITU-R Recommendation S.1503. In particular, the anticipated operational PFD mask shall take into account the expected maximum traffic loading distributions and geographic specific scheduling of the actual measured space station antenna patterns (see § 25.210(k)). The anticipated operational PFD masks shall also be in an electronic form that can be accessed by the computer program contained in paragraph (b)(1)(iii) of this section.

(ii) Identify and describe in detail the assumptions and conditions used in generating the anticipated operational power flux-density masks.

(iii) Provide a computer program for the single-entry additional operational  $EPFD_{down}$  verification computation, including both the source code and the executable file. This computer program could be developed by using the method specified in the most recent version of ITU-R Recommendation S.1503.

(iv) Identify and describe in detail the necessary input parameters for the execution of the additional operational  $EPFD_{down}$  verification computer pro-

gram identified in paragraph (b)(1)(iii) of this section.

(v) Provide the result, the cumulative probability distribution function of EPFD, of the execution of the verification computer program described in paragraph (b)(1)(iii) of this section by using only the input parameters contained in paragraphs (b)(1)(i) and (iv) of this section for each of the submitted test points provided by the Commission. These test points are based on information from U.S.-licensed geostationary satellite orbit Fixed-Satellite Service and Broadcasting-Satellite Service operators in the 10.7–14.5 GHz bands. Each U.S.-licensed geostationary satellite orbit Fixed-Satellite Service and Broadcasting-Satellite Service operator in the 10.7–14.5 GHz bands may submit up to 10 test points for this section containing the latitude, longitude, altitude, azimuth, elevation angle, antenna size, efficiency to be used by non-geostationary satellite orbit Fixed-Satellite Service licensees in the 10.7–14.5 GHz bands during the upcoming year.

(2) Operational equivalent power flux-density, space-to-Earth direction, (operational  $EPFD_{down}$ ) limits. Using the information contained in (b)(1) of this section plus the measured space station antenna patterns, provide the result of the execution of the computer simulation for the anticipated in-line operational  $EPFD_{down}$  levels for each of the submitted test points provided by the Commission. Submitted test points are based on inputs from U.S.-licensed geostationary satellite orbit Fixed-Satellite Service and Broadcasting-Satellite Service operators in the 10.7–14.5 GHz bands. Each U.S.-licensed geostationary satellite orbit Fixed-Satellite Service and Broadcasting-Satellite Service operator in the 10.7–14.5 GHz bands may submit up to 10 test points for this section containing the latitude, longitude, altitude, azimuth, elevation angle, antenna size, efficiency to be used by non-geostationary satellite orbit Fixed-Satellite Service licensees in the 10.7–14.5 GHz bands during the upcoming year.

(c) [Reserved]

(d) The Commission may request at any time additional information from

the NGSO FSS system applicant or licensee concerning the EPFD levels and the related technical showings.

(e) An NGSO FSS system licensee operating a system in compliance with the limits specified in § 25.208(g), (i), (j), (k), (l), and (m) shall be considered as having fulfilled its obligations under ITU Radio Regulations Article 22.2 with respect to any GSO network. However, such NGSO FSS system shall not claim protection from GSO FSS and BSS networks operating in accordance with part 25 of this chapter and the ITU Radio Regulations.

(f) Coordination will be required between NGSO FSS systems and GSO FSS earth stations in the frequency band 10.7–12.75 GHz when all of the following threshold conditions are met:

(1) Bandwidth overlap; and

(2) The satellite network using the GSO has specific receive earth stations which meet all of the following conditions: earth station antenna maximum isotropic gain greater than or equal to 64 dBi; G/T of 44 dB/K or higher; and emission bandwidth of 250 MHz; and the EPFD<sub>down</sub> radiated by the satellite system using the NGSO into the GSO specific receive earth station, either within the U.S. for domestic service or any points outside the U.S. for international service, as calculated using the ITU software for examining compliance with EPFD limits set forth in Article 22 of the ITU Radio Regulations exceeds  $-174.5 \text{ dB(W/(m}^2/40\text{kHz))}$  for any percentage of time for NGSO systems with all satellites only operating at or below 2500 km altitude, or  $-202 \text{ dB(W/(m}^2/40\text{kHz))}$  for any percentage of time for NGSO systems with any satellites operating above 2500 km altitude.

(3) If there is no ITU software for examining compliance with EPFD limits set forth in Article 22 of the ITU Radio Regulations, then the EPFD<sub>down</sub> coordination trigger is suspended and the requirement for coordination will be based on bandwidth overlap and the satellite network using the GSO has specific receive earth stations which meet all of the following conditions: earth station antenna maximum isotropic gain greater than or equal to 64 dBi; G/T of 44 dB/K or higher; and emission bandwidth of 250 MHz.

(g) *Operational power flux density, space-to-Earth direction, limits.* Ninety days prior to the initiation of service to the public, the NGSO FSS system licensee shall submit a technical showing for the NGSO FSS system in the band 12.2–12.7 GHz. The technical information shall demonstrate that the NGSO FSS system is capable of meeting the limits as specified in § 25.208(o). Licensees may not provide service to the public if they fail to demonstrate compliance with the PFD limits.

(h) *System License.* Applicants authorized to construct and launch a system of technically identical non-geostationary satellite orbit Fixed-Satellite Service satellites will be awarded a single “blanket” license covering a specified number of space stations to operate in a specified number of orbital planes.

(i) In addition to providing the information specified in § 25.114, each NGSO FSS applicant shall provide the following:

(1) A demonstration that the proposed system is capable of providing fixed-satellite services on a continuous basis throughout the fifty states, Puerto Rico and the U.S. Virgin Islands, U.S.; and

(2) A demonstration that the proposed system is capable of providing Fixed-Satellite Services to all locations as far north as 70° North Latitude and as far south as 55° South Latitude for at least 75 percent of every 24-hour period; and

(3) Sufficient information on the NGSO FSS system characteristics to properly model the system in computer sharing simulations, including, at a minimum, NGSO hand-over and satellite switching strategies, NGSO satellite antenna gain patterns, and NGSO earth station antenna gain patterns. In particular, each NGSO FSS applicant must explain the switching protocols it uses to avoid transmitting while passing through the geostationary satellite orbit arc, or provide an explanation as to how the PFD limits in § 25.208 are met without using geostationary satellite orbit arc avoidance. In addition, each NGSO FSS applicant must provide the orbital parameters contained in Section A.4 of Annex 2A to Appendix 4 of the ITU Radio Regulations (2008).

Further, each NGSO FSS applicant must provide a sufficient technical showing to demonstrate that the proposed non-geostationary satellite orbit system meets the PFD limits contained in § 25.208, as applicable, and

(4) [Reserved]

(j)–(l) [Reserved]

(m) Replacement of Space Stations within the System License Term. Licensees of NGSO FSS systems in the 10.7–12.7 GHz, 12.75–13.25 GHz and 13.75–14.5 GHz frequency bands authorized through a blanket license pursuant to paragraph (g) of this section need not file separate applications to launch and operate technically identical replacement satellites within the term of the system authorization. However, the licensee shall certify to the Commission, at least thirty days prior to launch of such replacement(s) that:

(1) The licensee intends to launch a space station into the previously-authorized orbit that is technically identical to those authorized in its system authorization and

(2) Launch of this space station will not cause the licensee to exceed the total number of operating space stations authorized by the Commission.

[66 FR 10619, Feb. 16, 2001, as amended at 67 FR 53510, Aug. 16, 2002; 68 FR 16447, Apr. 4, 2003; 68 FR 43946, July 25, 2003; 68 FR 51505, Aug. 27, 2003; 69 FR 31302, June 3, 2004; 70 FR 59277, Oct. 12, 2005; 78 FR 8423, Feb. 6, 2013; 79 FR 8320, Feb. 12, 2014]

**§ 25.147 Licensing provision for NGSO MSS feeder downlinks in the band 6700–6875 MHz.**

If an NGSO MSS satellite transmitting in the band 6700–6875 MHz causes harmful interference to previously licensed co-frequency Public Safety facilities, then that satellite licensee is obligated to remedy the interference complaint.

[67 FR 17299, Apr. 10, 2002]

**§ 25.148 Licensing provisions for the Direct Broadcast Satellite Service.**

(a) *License terms.* License terms for DBS facilities are specified in § 25.121(a).

(b) *Due diligence.* (1) All persons granted DBS authorizations shall proceed with due diligence in constructing DBS systems. Permittees shall be re-

quired to complete contracting for construction of the satellite station(s) within one year of the grant of the authorization. The satellite stations shall also be required to be in operation within six years of the authorization grant.

(2) In addition to the requirements stated in paragraph (b)(1) of this section, all persons who receive new or additional DBS authorizations after January 19, 1996 shall complete construction of the first satellite in their respective DBS systems within four years of grant of the authorization. All satellite stations in such a DBS system shall be in operation within six years of the grant of the authorization.

(3) DBS licensees shall be required to proceed consistent with all applicable due diligence obligations, unless otherwise determined by the Commission upon proper showing in any particular case. Transfer of control of the authorization shall not be considered to justify extension of these deadlines.

(c) *Geographic service requirements.* Those entities acquiring DBS authorizations after January 19, 1996, or who after January 19, 1996 modify a previous DBS authorization to launch a replacement satellite, must provide DBS service to Alaska and Hawaii where such service is technically feasible from the authorized orbital location. This requirement does not apply to DBS satellites authorized to operate at the 61.5° W.L. orbital location. DBS applicants seeking to operate from locations other than 61.5° W.L. who do not provide service to Alaska and Hawaii, must provide technical analyses to the Commission demonstrating that such service is not feasible as a technical matter, or that while technically feasible such services would require so many compromises in satellite design and operation as to make it economically unreasonable.

(d) *DBS subject to competitive bidding.* Mutually exclusive initial applications to provide DBS are subject to competitive bidding procedures. The general competitive bidding procedures set forth in part 1, subpart Q of this chapter will apply unless otherwise provided in this part.

(e) *DBS long form application.* Winning bidders are subject to the provisions of