

§ 25.225 Geographic Service Requirements for 17/24 GHz Broadcasting Satellite Service.

(a) Each operator of a 17/24 GHz BSS space station that is used to provide video programming directly to consumers in the 48 contiguous United States (CONUS) must provide comparable service to Alaska and Hawaii, unless such service is not technically feasible or not economically reasonable from the authorized orbital location.

(b) Each operator of a 17/24 GHz BSS space station subject to paragraph (a) of this section must design and configure its space station to be capable of providing service to Alaska and Hawaii, that is comparable to the service that such satellites will provide to CONUS subscribers, from any orbital location capable of providing service to either Alaska or Hawaii to which it may be located or relocated in the future.

(c) If an operator of a 17/24 GHz BSS space station that is used to provide video programming directly to consumers in the United States relocates or replaces a 17/24 GHz BSS space station at a location from which service to Alaska and Hawaii had been provided by another 17/24 GHz BSS space station, the operator must use a space station capable of providing at least the same level of service to Alaska and Hawaii as previously provided from that location.

[72 FR 50033, Aug. 29, 2007]

§ 25.226 Blanket Licensing provisions for domestic, U.S. Vehicle-Mounted Earth Stations (VMESs) receiving in the 10.95–11.2 GHz (space-to-Earth), 11.45–11.7 GHz (space-to-Earth), and 11.7–12.2 GHz (space-to-Earth) bands and transmitting in the 14.0–14.5 GHz (Earth-to-space) band, operating with Geostationary Satellites in the Fixed-Satellite Service.

(a) The following ongoing requirements govern all VMES licensees and operations in the 10.95–11.2 GHz (space-to-Earth), 11.45–11.7 GHz (space-to-Earth), 11.7–12.2 GHz (space-to-Earth) and 14.0–14.5 GHz (Earth-to-space) bands receiving from and transmitting to geostationary orbit satellites in the Fixed-Satellite Service. VMES licensees shall comply with the requirements

in either paragraph (a)(1), (a)(2) or (a)(3) of this section and all of the requirements set forth in paragraphs (a)(4) through (a)(9) and paragraphs (c), (d), and (e) of this section. Paragraph (b) of this section identifies items that shall be included in the application for VMES operations to demonstrate that these ongoing requirements will be met.

(1) The following requirements shall apply to a VMES that uses transmitters with off-axis EIRP spectral-densities lower than or equal to the levels in paragraph (a)(1)(i) of this section. A VMES, or VMES system, operating under this section shall provide a detailed demonstration as described in paragraph (b)(1) of this section. The VMES transmitter also shall comply with the antenna pointing and cessation of emission requirements in paragraphs (a)(1)(ii) and (a)(1)(iii) of this section.

(i) A VMES system shall not exceed the off-axis EIRP spectral-density limits and conditions defined in paragraphs (a)(1)(i)(A) through (D) of this section.

(A) The off-axis EIRP spectral-density emitted from the VMES, in the plane of the geostationary satellite orbit (GSO) as it appears at the particular earth station location, shall not exceed the following values:

15–10log(N)–25logθ dBW/4kHz for $1.5^\circ \leq \theta \leq 7^\circ$
 –6 –10log(N) dBW/4kHz for $7^\circ < \theta \leq 9.2^\circ$
 18 –10log(N)–25logθ dBW/4kHz for $9.2^\circ < \theta \leq 48^\circ$
 –24 –10log(N) dBW/4kHz for $48^\circ < \theta \leq 85^\circ$
 –14 –10log(N) dBW/4kHz for $85^\circ < \theta \leq 180^\circ$

where theta (θ) is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite, the plane of the GSO is determined by the focal point of the antenna and the line tangent to the arc of the GSO at the orbital location of the target satellite. For VMES networks using frequency division multiple access (FDMA) or time division multiple access (TDMA) techniques, N is equal to one. For VMES networks using multiple co-frequency transmitters that have the same EIRP, N is the maximum expected number of co-frequency simultaneously transmitting VMES earth stations in the

same satellite receiving beam. For the purpose of this section, the peak EIRP of an individual sidelobe shall not exceed the envelope defined above for θ between 1.5° and 7.0° . For θ greater than 7.0° , the envelope shall be exceeded by no more than 10% of the sidelobes, provided no individual sidelobe exceeds the envelope given above by more than 3 dB.

(B) In all directions other than along the GSO, the off-axis EIRP spectral-density for co-polarized signals emitted from the VMES shall not exceed the following values:

$$\begin{aligned} &18 - 10\log(N) - 25\log\theta \text{ dBW/4kHz for } 3.0^\circ \leq \theta \leq 48^\circ \\ &-24 - 10\log(N) \text{ dBW/4kHz for } 48^\circ < \theta \leq 85^\circ \\ &-14 - 10\log(N) \text{ dBW/4kHz for } 85^\circ < \theta \leq 180^\circ \end{aligned}$$

where θ and N are defined in paragraph (a)(1)(i)(A) of this section. This off-axis EIRP spectral-density applies in any plane that includes the line connecting the focal point of the antenna to the orbital location of the target satellite with the exception of the plane of the GSO as defined in paragraph (a)(1)(i)(A) of this section. For the purpose of this subsection, the envelope shall be exceeded by no more than 10% of the sidelobes provided no individual sidelobe exceeds the gain envelope given above by more than 6 dB. The region of the main reflector spillover energy is to be interpreted as a single lobe and shall not exceed the envelope by more than 6 dB.

(C) In all directions, the off-axis EIRP spectral-density for cross-polarized signals emitted from the VMES shall not exceed the following values:

$$\begin{aligned} &5 - 10\log(N) - 25\log\theta \text{ dBW/4kHz for } 1.8^\circ \leq \theta \leq 7.0^\circ \\ &-16 - 10\log(N) \text{ dBW/4kHz for } 7.0^\circ < \theta \leq 9.2^\circ \end{aligned}$$

where θ and N are defined as set forth in paragraph (a)(1)(i)(A) of this section. This EIRP spectral-density applies in any plane that includes the line connecting the focal point of the antenna to the target satellite.

(D) For non-circular VMES antennas, the major axis of the antenna shall be aligned with the tangent to the arc of the GSO at the orbital location of the target satellite, to the extent required to meet the specified off-axis EIRP spectral-density criteria.

(ii) Except for VMES systems operating under paragraph (a)(3), each VMES transmitter must meet one of the following antenna pointing error requirements:

(A) Each VMES transmitter shall maintain a pointing error of less than or equal to 0.2° between the orbital lo-

cation of the target satellite and the axis of the main lobe of the VMES antenna, or

(B) Each VMES transmitter shall declare a maximum antenna pointing error that may be greater than 0.2° provided that the VMES does not exceed the off-axis EIRP spectral-density limits in paragraph (a)(1)(i) of this section, taking into account the antenna pointing error.

(iii) Except for VMES systems operating under paragraph (a)(3), each VMES transmitter must meet one of the following cessation of emission requirements:

(A) For VMESs operating under paragraph (a)(1)(ii)(A) of this section, all emissions from the VMES shall automatically cease within 100 milliseconds if the angle between the orbital location of the target satellite and the axis of the main lobe of the VMES antenna exceeds 0.5° , and transmission shall not resume until such angle is less than or equal to 0.2° , or

(B) For VMES transmitters operating under paragraph (a)(1)(ii)(B) of this section, all emissions from the VMES shall automatically cease within 100 milliseconds if the angle between the orbital location of the target satellite and the axis of the main lobe of the VMES antenna exceeds the declared maximum antenna pointing error and shall not resume transmissions until such angle is less than or equal to the declared maximum antenna pointing error.

(2) The following requirements shall apply to a VMES that uses off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(1)(i) of this section. A VMES, or VMES system, operating under this subsection shall file certifications and provide a detailed demonstration as described in paragraph (b)(2) of this section.

(i) The VMES shall transmit only to the target satellite system(s) referred to in the certifications required by paragraph (b)(2) of this section.

(ii) If a good faith agreement cannot be reached between the target satellite operator and the operator of a future satellite that is located within 6 degrees longitude of the target satellite, the VMES operator shall accept the

power-density levels that would accommodate that adjacent satellite.

(iii) The VMES shall operate in accordance with the off-axis EIRP spectral-densities that the VMES supplied to the target satellite operator in order to obtain the certifications listed in paragraph (b)(2) of this section. The VMES shall automatically cease emissions within 100 milliseconds if the VMES transmitter exceeds the off-axis EIRP spectral-densities supplied to the target satellite operator.

(3) The following requirements shall apply to a VMES system that uses variable power-density control of individual simultaneously transmitting co-frequency VMES earth stations in the same satellite receiving beam. A VMES system operating under this subsection shall file certifications and provide a detailed demonstration as described in paragraph (b)(3) of this section.

(i) The effective aggregate EIRP-density from all terminals shall be at least 1 dB below the off-axis EIRP-density limits defined in paragraph (a)(1)(i) of this section, with the value of $N=1$. In this context the term “effective” means that the resultant co-polarized and cross-polarized EIRP-density experienced by any GSO or non-GSO satellite shall not exceed that produced by a single transmitter operating 1 dB below the limits defined in paragraph (a)(1)(i) of this section. The individual VMES transmitter shall automatically cease emissions within 100 milliseconds if the VMES transmitter exceeds the off-axis EIRP-density limits minus 1 dB specified above. If one or more VMES transmitters causes the aggregate off-axis EIRP-densities to exceed the off-axis EIRP-density limits minus 1 dB specified above, then the transmitter or transmitters shall cease or reduce emissions within 100 milliseconds of receiving a command from the system’s network control and monitoring center. A VMES system operating under this subsection shall provide a detailed demonstration as described in paragraph (b)(3)(i) of this section.

(ii) The following requirements shall apply to a VMES that uses off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(3)(i) of this section. A VMES system operating under

this section shall file certifications and provide a detailed demonstration as described in paragraphs (b)(3)(ii) and (b)(3)(iii) of this section.

(A) If a good faith agreement cannot be reached between the target satellite operator and the operator of a future satellite that is located within 6 degrees longitude of the target satellite, the VMES shall operate at an EIRP-density defined in paragraph (a)(3)(i) of this section.

(B) The VMES shall operate in accordance with the off-axis EIRP spectral-densities that the VMES supplied to the target satellite operator in order to obtain the certifications listed in paragraph (b)(3)(ii) of this section. The individual VMES terminals shall automatically cease emissions within 100 milliseconds if the VMES transmitter exceeds the off-axis EIRP spectral-densities supplied to the target satellite operator. The overall system shall be capable of shutting off an individual transmitter or the entire system if the aggregate off-axis EIRP spectral-densities exceed those supplied to the target satellite operator.

(C) The VMES shall transmit only to the target satellite system(s) referred to in the certifications required by paragraph (b)(3) of this section.

(4) An applicant filing to operate a VMES terminal or system and planning to use a contention protocol shall certify that its contention protocol use will be reasonable.

(5) There shall be a point of contact in the United States, with phone number and address, available 24 hours a day, seven days a week, with authority and ability to cease all emissions from the VMESs.

(6) For each VMES transmitter, a record of the vehicle location (i.e., latitude/longitude), transmit frequency, channel bandwidth and satellite used shall be time annotated and maintained for a period of not less than one (1) year. Records shall be recorded at time intervals no greater than every five (5) minutes while the VMES is transmitting. The VMES operator shall make this data available upon request to a coordinator, fixed system operator, Fixed-Satellite Service system operator, NTIA, or the Commission within 24 hours of the request.

(7) In the 10.95–11.2 GHz (space-to-Earth) and 11.45–11.7 GHz (space-to-Earth) frequency bands VMESs shall not claim protection from interference from any authorized terrestrial stations to which frequencies are either already assigned, or may be assigned in the future.

(8) A VMES terminal receiving in the 10.95–11.2 GHz (space-to-Earth), 11.45–11.7 GHz (space-to-Earth) and 11.7–12.2 GHz (space-to-Earth) bands shall receive protection from interference caused by space stations other than the target space station only to the degree to which harmful interference would not be expected to be caused to an earth station employing an antenna conforming to the referenced patterns defined in § 25.209(a) and (b) and stationary at the location at which any interference occurred.

(9) Each VMES terminal shall automatically cease transmitting upon the loss of synchronization or within 5 seconds upon loss of reception of the satellite downlink signal, whichever is the shorter timeframe.

(b) Applications for VMES operation in the 14.0–14.5 GHz (Earth-to-space) band to GSO satellites in the Fixed-Satellite Service shall include, in addition to the particulars of operation identified on Form 312, and associated Schedule B, the applicable technical demonstrations in paragraphs (b)(1), (2) or (3) of this section and the documentation identified in paragraphs (b)(4) through (8) of this section.

(1) A VMES applicant proposing to implement a transmitter under paragraph (a)(1) of this section shall demonstrate that the transmitter meets the off-axis EIRP spectral-density limits contained in paragraph (a)(1)(i) of this section. To provide this demonstration, the application shall include the tables described in paragraph (b)(1)(i) of this section or the certification described in paragraph (b)(1)(ii) of this section. The VMES applicant also shall provide the value N described in paragraph (a)(1)(i)(A) of this section. A VMES applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(A) of this section shall provide the certifications identified in paragraph (b)(1)(iii) of this section. A VMES applicant proposing to imple-

ment a transmitter under paragraph (a)(1)(ii)(B) of this section shall provide the demonstrations identified in paragraph (b)(1)(iv) of this section.

(i) Any VMES applicant filing an application pursuant to paragraph (a)(1) of this section shall file three tables showing the off-axis EIRP density level of the proposed earth station antenna in the direction of the plane of the GSO; the co-polarized EIRP density in the elevation plane, that is, the plane perpendicular to the plane of the GSO; and cross polarized EIRP density. Each table shall provide the EIRP density level at increments of 0.1° for angles between 0° and 10° off-axis, and at increments of 5° for angles between 10° and 180° off-axis.

(A) For purposes of the off-axis EIRP density table in the plane of the GSO, the off-axis angle is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite, and the plane of the GSO is determined by the focal point of the antenna and the line tangent to the arc of the GSO at the orbital position of the target satellite.

(B) For purposes of the off-axis co-polarized EIRP density table in the elevation plane, the off-axis angle is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite, and the elevation plane is defined as the plane perpendicular to the plane of the GSO defined in paragraph (b)(1)(i)(A) of this section.

(C) For purposes of the cross-polarized EIRP density table, the off-axis angle is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite and the plane of the GSO as defined in paragraph (b)(1)(i)(A) of this section will be used.

(ii) A VMES applicant shall include a certification, in Schedule B, that the VMES antenna conforms to the gain pattern criteria of § 25.209(a) and (b), that, combined with the maximum input power density calculated from the EIRP density less the antenna gain, which is entered in Schedule B, demonstrates that the off-axis EIRP spectral density envelope set forth in paragraphs (a)(1)(i)(A) through (C) of

this section will be met under the assumption that the antenna is pointed at the target satellite. If an antenna proposed for use by the applicant does not comply with the antenna performance standards contained in §25.209(a) and (b), the applicant must provide, as an exhibit to its application, antenna gain test plots pursuant to §25.132(b)(3).

(iii) A VMES applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(A) of this section shall provide a certification from the equipment manufacturer stating that the antenna tracking system will maintain a pointing error of less than or equal to 0.2° between the orbital location of the target satellite and the axis of the main lobe of the VMES antenna and that the antenna tracking system is capable of ceasing emissions within 100 milliseconds if the angle between the orbital location of the target satellite and the axis of the main lobe of the VMES antenna exceeds 0.5°.

(iv) A VMES applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(B) of this section shall:

(A) Declare, in its application, a maximum antenna pointing error and demonstrate that the maximum antenna pointing error can be achieved without exceeding the off-axis EIRP spectral-density limits in paragraph (a)(1)(i) of this section; and

(B) Demonstrate that the VMES transmitter can detect if the transmitter exceeds the declared maximum antenna pointing error and can cease transmission within 100 milliseconds if the angle between the orbital location of the target satellite and the axis of the main lobe of the VMES antenna exceeds the declared maximum antenna pointing error, and will not resume transmissions until the angle between the orbital location of the target satellite and the axis of the main lobe of the VMES antenna is less than or equal to the declared maximum antenna pointing error.

(2) A VMES applicant proposing to implement a transmitter under paragraph (a)(2) of this section and using off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(1)(i) of this section shall provide the following certifications and demonstra-

tion as exhibits to its earth station application:

(i) A statement from the target satellite operator certifying that the proposed operation of the VMES has the potential to create harmful interference to satellite networks adjacent to the target satellite(s) that may be unacceptable.

(ii) A statement from the target satellite operator certifying that the power density levels that the VMES applicant provided to the target satellite operator are consistent with the existing coordination agreements between its satellite(s) and the adjacent satellite systems within 6° of orbital separation from its satellite(s).

(iii) A statement from the target satellite operator certifying that it will include the power-density levels of the VMES applicant in all future coordination agreements.

(iv) A demonstration from the VMES operator that the VMES system is capable of detecting and automatically ceasing emissions within 100 milliseconds when the transmitter exceeds the off-axis EIRP spectral-densities supplied to the target satellite operator.

(3) A VMES applicant proposing to implement VMES system under paragraph (a)(3) of this section and using variable power-density control of individual simultaneously transmitting co-frequency VMES earth stations in the same satellite receiving beam shall provide the following certifications and demonstration as exhibits to its earth station application:

(i) The applicant shall make a detailed showing of the measures it intends to employ to maintain the effective aggregate EIRP-density from all simultaneously transmitting co-frequency terminals operating with the same satellite transponder at least 1 dB below the off-axis EIRP-density limits defined in paragraphs (a)(1)(i)(A) through (C) of this section. In this context the term “effective” means that the resultant co-polarized and cross-polarized EIRP-density experienced by any GSO or non-GSO satellite shall not exceed that produced by a single VMES transmitter operating at 1 dB below the limits defined in paragraphs (a)(1)(i)(A) through (C) of this section.

The applicant also must demonstrate that an individual transmitter and the entire VMES system is capable of automatically ceasing emissions within 100 milliseconds if the aggregate off-axis EIRP-densities exceed the off-axis EIRP-density limits minus 1 dB, as set forth in paragraph (a)(3)(i) of this section. The International Bureau will place this showing on public notice along with the application.

(ii) An applicant proposing to implement a VMES under paragraph (a)(3)(ii) of this section that uses off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(3)(i) of this section shall provide the following certifications, demonstration and list of satellites as exhibits to its earth station application:

(A) A detailed showing of the measures the applicant intends to employ to maintain the effective aggregate EIRP-density from all simultaneously transmitting co-frequency terminals operating with the same satellite transponder at the EIRP-density limits supplied to the target satellite operator. The International Bureau will place this showing on public notice along with the application.

(B) A statement from the target satellite operator certifying that the proposed operation of the VMES has the potential to create harmful interference to satellite networks adjacent to the target satellite(s) that may be unacceptable.

(C) A statement from the target satellite operator certifying that the aggregate power density levels that the VMES applicant provided to the target satellite operator are consistent with the existing coordination agreements between its satellite(s) and the adjacent satellite systems within 6° of orbital separation from its satellite(s).

(D) A statement from the target satellite operator certifying that it will include the aggregate power-density levels of the VMES applicant in all future coordination agreements.

(E) A demonstration from the VMES operator that the VMES system is capable of detecting and automatically ceasing emissions within 100 milliseconds when an individual transmitter exceeds the off-axis EIRP spectral-densities supplied to the target satellite

operator and that the overall system is capable of shutting off an individual transmitter or the entire system if the aggregate off-axis EIRP spectral-densities exceed those supplied to the target satellite operator.

(F) An identification of the specific satellite or satellites with which the VMES system will operate.

(iii) The applicant shall acknowledge that it will maintain sufficient statistical and technical information on the individual terminals and overall system operation to file a detailed report, one year after license issuance, describing the effective aggregate EIRP-density levels resulting from the operation of the VMES system.

(4) There shall be an exhibit included with the application describing the geographic area(s) in which the VMESs will operate.

(5) Any VMES applicant filing for a VMES terminal or system and planning to use a contention protocol shall include in its application a certification that will comply with the requirements of paragraph (a)(4) of this section.

(6) The point of contact referred to in paragraph (a)(5) of this section shall be included in the application.

(7) Any VMES applicant filing for a VMES terminal or system shall include in its application a certification that will comply with the requirements of paragraph (a)(6) of this section.

(8) All VMES applicants shall submit a radio frequency hazard analysis determining via calculation, simulation, or field measurement whether VMES terminals, or classes of terminals, will produce power densities that will exceed the Commission's radio frequency exposure criteria. VMES applicants with VMES terminals that will exceed the guidelines in §1.1310 of this chapter for radio frequency radiation exposure shall provide, with their environmental assessment, a plan for mitigation of radiation exposure to the extent required to meet those guidelines. All VMES licensees shall ensure installation of VMES terminals on vehicles by qualified installers who have an understanding of the antenna's radiation environment and the measures best suited to maximize protection of the general public and persons operating the

vehicle and equipment. A VMES terminal exhibiting radiation exposure levels exceeding 1.0 mW/cm^2 in accessible areas, such as at the exterior surface of the radome, shall have a label attached to the surface of the terminal warning about the radiation hazard and shall include thereon a diagram showing the regions around the terminal where the radiation levels could exceed 1.0 mW/cm^2 . All VMES applicants shall demonstrate that their VMES terminals are capable of automatically ceasing transmissions upon the loss of synchronization or within 5 seconds upon loss of reception of the satellite downlink signal, whichever is the shorter timeframe.

(9) Except for VMES systems operating pursuant to paragraphs (a)(2) and (a)(3)(ii) of this section, VMES systems authorized pursuant to this section shall be eligible for a license that lists Permitted List as an authorized point of communication.

(c)(1) Operations of VMESs in the 14.0–14.2 GHz (Earth-to-space) frequency band within 125 km of the NASA TDRSS facilities on Guam (latitude $13^\circ 36' 55''$ N, longitude $144^\circ 51' 22''$ E) or White Sands, New Mexico (latitude $32^\circ 20' 59''$ N, longitude $106^\circ 36' 31''$ W and latitude $32^\circ 32' 40''$ N, longitude $106^\circ 36' 48''$ W) are subject to coordination with the National Aeronautics and Space Administration (NASA) through the National Telecommunications and Information Administration (NTIA) Interdepartment Radio Advisory Committee (IRAC). Licensees shall notify the International Bureau once they have completed coordination. Upon receipt of such notification from a licensee, the International Bureau will issue a public notice stating that the licensee may commence operations within the coordination zone in 30 days if no party has opposed the operations.

(2) When NTIA seeks to provide similar protection to future TDRSS sites that have been coordinated through

the IRAC Frequency Assignment Subcommittee process, NTIA will notify the Commission's International Bureau that the site is nearing operational status. Upon public notice from the International Bureau, all Ku-band VMES licensees shall cease operations in the 14.0–14.2 GHz band within 125 km of the new TDRSS site until the licensees complete coordination with NTIA/IRAC for the new TDRSS facility. Licensees shall notify the International Bureau once they have completed coordination for the new TDRSS site. Upon receipt of such notification from a licensee, the International Bureau will issue a public notice stating that the licensee may commence operations within the coordination zone in 30 days if no party has opposed the operations. The VMES licensee then will be permitted to commence operations in the 14.0–14.2 GHz band within 125 km of the new TDRSS site, subject to any operational constraints developed in the coordination process.

(d)(1) Operations of VMESs in the 14.47–14.5 GHz (Earth-to-space) frequency band in the vicinity of radio astronomy service (RAS) observatories observing in the 14.47–14.5 GHz band are subject to coordination with the National Science Foundation (NSF). The appropriate NSF contact point to initiate coordination is Electromagnetic Spectrum Manager, NSF, 4201 Wilson Blvd., Suite 1045, Arlington VA 22203, fax 703-292-9034, e-mail *esm@nsf.gov*. Licensees shall notify the International Bureau once they have completed coordination. Upon receipt of the coordination agreement from a licensee, the International Bureau will issue a public notice stating that the licensee may commence operations within the coordination zone in 30 days if no party has opposed the operations.

(2) Table 1 provides a list of each applicable RAS site, its location, and the applicable coordination zone.

TABLE 1—APPLICABLE RADIO ASTRONOMY SERVICE (RAS) FACILITIES AND ASSOCIATED COORDINATION DISTANCES

| Observatory | Latitude (north) | Longitude (west) | Radius (km) of coordination zone |
|--|---------------------|----------------------|----------------------------------|
| Arecibo, Observatory, Arecibo, PR | $18^\circ 20' 37''$ | $66^\circ 45' 11''$ | Island of Puerto Rico. |
| Green Bank, WV | $38^\circ 25' 59''$ | $79^\circ 50' 23''$ | 160. |
| Very Large Array, near Socorro, NM | $34^\circ 04' 44''$ | $107^\circ 37' 06''$ | 160. |

TABLE 1—APPLICABLE RADIO ASTRONOMY SERVICE (RAS) FACILITIES AND ASSOCIATED COORDINATION DISTANCES—Continued

| Observatory | Latitude (north) | Longitude (west) | Radius (km) of coordination zone |
|---|------------------|------------------|----------------------------------|
| Pisgah Astronomical Research Institute, Rosman, NC | 35°11'59" | 82°52'19" | 160. |
| U of Michigan Radio Astronomy Observatory, Stinchfield Woods, MI. | 42°23'56" | 83°56'11" | 160. |
| Very Long Baseline Array (VLBA) stations: | | | |
| Owens Valley, CA | 37°13'54" | 118°16'37" | 160*. |
| Mauna Kea, HI | 19°48'05" | 155°27'20" | 50. |
| Brewster, WA | 48°07'52" | 119°41'00" | |
| Kitt Peak, AZ | 31°57'23" | 111°36'45" | |
| Pie Town, NM | 34°18'04" | 108°07'09" | |
| Los Alamos, NM | 35°46'30" | 106°14'44" | |
| Fort Davis, TX | 30°38'06" | 103°56'41" | |
| North Liberty, IA | 41°46'17" | 91°34'27" | |
| Hancock, NH | 42°56'01" | 71°59'12" | |
| St. Croix, VI | 17°45'24" | 64°35'01" | |

* Owens Valley, CA operates both a VLBA station and single-dish telescopes.

(3) When NTIA seeks to provide similar protection to future RAS sites that have been coordinated through the IRAC Frequency Assignment Subcommittee process, NTIA will notify the Commission's International Bureau that the site is nearing operational status. Upon public notice from the International Bureau, all Ku-band VMES licensees shall cease operations in the 14.47–14.5 GHz band within the relevant geographic zone (160 kms for single-dish radio observatories and Very Large Array antenna systems and 50 kms for Very Long Baseline Array antenna systems) of the new RAS site until the licensees complete coordination for the new RAS facility. Licensees shall notify the International Bureau once they have completed coordination for the new RAS site and shall submit the coordination agreement to the Commission. Upon receipt of such notification from a licensee, the International Bureau will issue a public notice stating that the licensee may commence operations within the coordination zone in 30 days if no party opposed the operations. The VMES licensee then will be permitted to commence operations in the 14.47–14.5 GHz band within the relevant coordination distance around the new RAS site, subject to any operational constraints developed in the coordination process.

(e) VMES licensees shall use Global Positioning Satellite-related or other similar position location technology to

ensure compliance with paragraphs (c) and (d) of this section.

[74 FR 57099, Nov. 4, 2009, as amended at 78 FR 8429, Feb. 6, 2013; 78 FR 9604, Feb. 11, 2013; 79 FR 8324, Feb. 12, 2014]

§ 25.227 Blanket licensing provisions for Earth Stations Aboard Aircraft (ESAAs) receiving in the 10.95–11.2 GHz (space-to-Earth), 11.45–11.7 GHz (space-to-Earth), and 11.7–12.2 GHz (space-to-Earth) frequency bands and transmitting in the 14.0–14.5 GHz (Earth-to-space) frequency band, operating with Geostationary Satellites in the Fixed-Satellite Service.

(a) The following ongoing requirements govern all ESAA licensees and operations in the 10.95–11.2 GHz (space-to-Earth), 11.45–11.7 GHz (space-to-Earth), 11.7–12.2 GHz (space-to-Earth) and 14.0–14.5 GHz (Earth-to-space) frequency bands receiving from and transmitting to geostationary orbit satellites in the Fixed-Satellite Service. ESAA licensees shall comply with the requirements in either paragraph (a)(1), (a)(2) or (a)(3) of this section and all of the requirements set forth in paragraphs (a)(4) through (a)(16) and paragraphs (c), (d), and (e) of this section. Paragraph (b) of this section identifies items that shall be included in the application for ESAA operations to demonstrate that these ongoing requirements will be met.

(1) The following requirements shall apply to an ESAA that uses transmitters with off-axis EIRP spectral-densities lower than or equal to the levels