

Mangata Networks Compliance Matrix

| Rule | Requirement | Application Reference |
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| §25.110 Submitting your application | (b)(2) Except as provided in paragraph (b)(3) of this section, applications for space station licenses must be filed electronically on FCC Form 312 in accordance with the applicable provisions of part 1, subpart Y of this chapter and include all information required by §25.114. | See FCC Form 312, Schedule S, and associated application materials |
| §25.112 Dismissal and return of applications | (a) An application will be unacceptable for filing and will be returned to the applicant with a brief statement identifying the omissions or discrepancies if: (1) The application is defective with respect to completeness of answers to questions, informational showings, internal inconsistencies, execution, or other matters of a formal character; | To the extent necessary, Mangata Networks requests a waiver of 25.112(a)(1). See Legal Narrative Section III.D.2 |
| §25.113 Station construction, deployment approval and operation of spare satellites | (h) An operator of NGSO space stations under a blanket license granted by the Commission need not apply for license modification to operate technically identical in-orbit spare satellites in an authorized orbit. However, the licensee must notify the Commission within 30 days of bringing an in-orbit spare into service and certify that its activation has not exceeded the number of space stations authorized to provide service and that the licensee has determined by measurement that the activated spare is operating within the terms of the license. | Mangata Networks will comply. |
| | (i) An operator of NGSO space stations under a blanket license granted by the Commission need not apply for license modification to deploy and operate technically identical replacement satellites in an authorized orbit within the term of the system authorization. However, the licensee must notify the Commission of the intended launch at least 30 days in advance and certify that its operation of the additional space station(s) will not increase the number of space stations providing service above the maximum number specified in the license. | Mangata Networks will comply. |
| §25.114 Applications for space station authorizations | (a)(1) A license application filed pursuant to § 25.110(b)(2) for a GSO space station or NGSO space station or space-station constellation must comprise a comprehensive proposal and must be submitted on FCC Form 312, Main Form and Schedule S, with attached exhibits required by paragraph (d) of this section. | See FCC Form 312, Schedule S, and associated application materials |
| | (a)(2) An application for blanket authority for an NGSO constellation of space stations that are not all technically identical must provide the information required by paragraphs | All Mangata space stations are technically identical |

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| (c) and (d) of this section for each type of station in the constellation. | (See Technical Narrative Section I) |
| (b) Each application for a new or modified space station authorization must contain the formal waiver required by 47 U.S.C. 304. | See FCC Form 312 |
| (c) The following info shall be filed on FCC Form 312, Main form and Schedule S: | |
| (c)(1) Name, address, and telephone number of the applicant | |
| (c)(2) Name, address, and telephone number of the person(s), including counsel, to whom inquiries or correspondence should be directed | |
| (c)(3) Type of authorization requested (e.g., launch authority, station license, modification of authorization); | |
| (c)(4)(i) For each space station transmitting and receiving antenna beam (including telemetry and tracking beams but not command beams), specify channel center frequencies and bandwidths and polarization plan . For command beams, specify each of the center frequencies within a 5 MHz range or a range of 2 percent of the assigned bandwidth , whichever is smaller, and the polarization plan. If the space station can vary channel bandwidth in a particular frequency band with on-board processing, specify only the range of frequencies in that band over which the beam can operate and the polarization plan . | See Schedule S |
| (c)(4)(ii) Specify maximum EIRP and maximum EIRP density for each space station transmitting antenna beam. If the satellite uses shapeable antenna beams, as defined in § 25.103, specify instead maximum possible EIRP and maximum possible EIRP density within each shapeable beam's proposed coverage area. Provide this information for each frequency band in which the transmitting antenna would operate. For bands below 15 GHz, specify EIRP density in dBW/4 kHz; for bands at and above 15 GHz, specify EIRP density in dBW/MHz . If the EIRP density varies over time, specify the maximum possible EIRP density. | |
| (c)(4)(v) For each space station receiving beam other than command beams, specify the gain-to-temperature ratio at beam peak . For receiving beams fed into transponders, also specify the minimum and maximum saturation flux density at beam peak . If the satellite uses shapeable beams, specify the minimum and maximum gain-to-temperature ratio within each shapeable beam's proposed coverage area, and for shapeable | |

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| | <p>receiving beams fed into transponders, specify the minimum and maximum saturation power flux density within the 0 dB relative antenna gain isoline. Provide this information for each frequency band in which the receiving beam can operate. For command beams, specify the beam peak flux density at the command threshold;</p> | |
| | <p>(c)(4)(vi)(B) For NGSOs, specify for each unique orbital plane the predicted antenna gain contour(s) for each Tx and Rx antenna beam for one space station if all space stations are identical in the constellation. If individual space stations in the constellation have different antenna beam configurations, specify the predicted antenna gain contours for each transmit and receive beam for each space station type and orbit or orbital plane requested. The contours should be plotted on an area map with the beam depicted on the surface of the earth with the space stations' peak antenna gain pointed at nadir to a latitude and longitude within the proposed service area. The contour(s) should be plotted at 2 dB intervals down to 10 dB below the peak gain and at 5 dB intervals between 10 dB and 20 dB below the peak gain. For inter-satellite links, specify the peak antenna gain and 3 dB beamwidth.</p> | |
| | <p>(c)(4)(vi)(C) For space stations with shapeable antenna beams, specify the contours, as defined in paragraph (c)(4)(vi)(A) or (B) of this section, for the transmitting beam configuration that results in the highest EIRP density for the beams listed in paragraph (c)(4)(ii) of this section and for the receiving beam configuration with the smallest gain-to-temperature ratio and the highest required saturation power flux density for the beams listed in paragraph (c)(4)(v) of this section. If the shapeable beams are also steerable, include the contours that would result from moving the beam peak around the limit of the effective beam peak area and the 0 dB relative antenna gain isoline. The proposed maximum coverage area must be clearly specified.</p> | |
| | <p>(c)(6) For space stations in NGSO orbit:</p> | <p>See Schedule S and</p> |
| | <p>(c)(6)(i-ix): (i) The number of orbital planes and the number of space stations in each plane, (ii) The inclination of the orbital plane(s), (iii) The orbital period, (iv) The apogee, (v) The perigee, (vi) The argument(s) of perigee, (vii) Active service arc(s), (viii) Right ascension of the ascending node(s), and (ix) For each satellite in each orbital plane, the initial phase angle at the reference time.</p> | <p>Technical Narrative Sections I, I.A</p> |

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| | (c)(7) Frequency bands, types of service, and coverage area | See Schedule S and Technical Narrative Sections I.B and I.C |
| | (c)(8) Calculated maximum power flux-density levels within each coverage area and energy dispersal bandwidths, if any, needed for compliance with § 25.208, for the angles of arrival specified in the applicable paragraph(s) of § 25.208, except for an NGSO FSS applicant certifying compliance with PFD limits under § 25.146(a)(1); | See Schedule S and Technical Narrative Section II.B |
| | (c)(10) Estimated operational lifetime | See Schedule S and Technical Narrative Section I |
| | (c)(11) Whether the space station is to be operated on a common carrier basis; | See FCC Form 312 |
| | (d) The following information in narrative form shall be contained in each application: | See Technical Narrative Section I.A. and I.C. |
| | (d)(1) Overall description of system facilities, operations and services and explanation of how uplink frequency bands would be connected to downlink frequency bands; | |
| | (d)(6) Public interest considerations in support of the grant | See Legal Narrative Section III |
| | (d)(12) The information required by § 25.146, if the application is for an NGSO FSS system authorization within the 10.7-30 GHz band. | See Technical Narrative Section II.B. |
| §25.114(d)(14) Orbital Debris Mitigation | (d)(14) A description of the design and operational strategies that will be used to mitigate orbital debris, including the following information: | Mangata Networks will comply. See Technical Narrative Section II.C |
| | (d)(14)(i) A statement that the space station operator has assessed and limited the amount of debris released in a planned manner during normal operations . Where applicable, this statement must include an orbital debris mitigation disclosure for any separate deployment devices, distinct from the space station launch vehicle, that may become a source of orbital debris; | |
| | (d)(14)(ii) A statement indicating whether the space station operator has assessed and limited the probability that the space station(s) will become a source of debris by collision with small debris or meteoroids that would cause loss of control and prevent disposal. The statement must indicate whether this probability for an individual space station is 0.01 (1 in 100) or less, as calculated using the NASA Debris Assessment Software or a higher fidelity assessment tool; | |

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| <p>(d)(14)(iii) A statement that the space station operator has assessed and limited the probability, during and after completion of mission operations, of accidental explosions or of release of liquids that will persist in droplet form. This statement must include a demonstration that debris generation will not result from the conversion of energy sources on board the spacecraft into energy that fragments the spacecraft. Energy sources include chemical, pressure, and kinetic energy. This demonstration should address whether stored energy will be removed at the spacecraft's end of life, by depleting residual fuel and leaving all fuel line valves open, venting any pressurized system, leaving all batteries in a permanent discharge state, and removing any remaining source of stored energy, or through other equivalent procedures specifically disclosed in the application;</p> | |
| <p>(d)(14)(iii)(Proposed) A statement that the space station operator has assessed and limited the probability, during and after completion of mission operations, of accidental explosions or of release of liquids that will persist in droplet form. This statement must include a demonstration that the integrated probability of debris-generating explosions for all credible failure modes of the space station (excluding small particle impacts) is less than 0.001 (1 in 1,000) during deployment and mission operations. Energy sources include chemical, pressure, and kinetic energy. This demonstration should address whether stored energy will be removed at the spacecraft's end of life, by depleting residual fuel and leaving all fuel line valves open, venting any pressurized system, leaving all batteries in a permanent discharge state, and removing any remaining source of stored energy, or through other equivalent procedures specifically disclosed in the application</p> | <p>Mangata Networks acknowledges this proposed requirement, and will comply upon codification into the FCC's Part 25 rules.</p> |
| <p>(d)(14)(iv) A statement that the space station operator has assessed and limited the probability of the space station(s) becoming a source of debris by collisions with large debris or other operational space stations.</p> | <p>Mangata Networks will comply. See Technical Narrative Section II.C</p> |
| <p>(d)(14)(iv)(A) Where the application is for an NGSO space station or system, the following information must also be included:</p> | |
| <p>(d)(14)(iv)(A)(1) A demonstration that the space station operator has assessed and limited the probability of collision between any space station of the system and other large objects (10 cm or larger in diameter) during the total orbital lifetime of the space</p> | |

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| <p>station, including any de-orbit phases, to less than 0.001 (1 in 1,000). The probability shall be calculated using the NASA Debris Assessment Software or a higher fidelity assessment tool. The collision risk may be assumed zero for a space station during any period in which the space station will be maneuvered effectively to avoid colliding with large objects.</p> | |
| <p>(d)(14)(iv)(A)(1)(Proposed) A demonstration that the space station operator has assessed and limited the probability of collision between any space station of the system and other large objects (10 cm or larger in diameter) during the total orbital lifetime of the space station, including any de-orbit phases, to less than 0.001 (1 in 1,000). The probability shall be calculated using the NASA Debris Assessment Software or a higher fidelity assessment tool. The collision risk may be assumed zero for a space station during any period in which the space station will be maneuvered effectively to avoid colliding with large objects. For systems consisting of multiple space stations, the statement must also include an assessment of the total probability of collision, calculated as the sum of the probability of collision associated with each individual space station. The total estimated number of space stations deployed over a 15-year period, including any replacement space stations, must be used for this calculation. Where the total probability of collision exceeds 0.001 (1 in 1,000) assuming a 10% failure rate of any maneuvering capability at an orbit that presents the worst case for collision risk, the statement must include an additional demonstration of the expected failure rate of maneuverability, and the orbit where the operator would expect most failures to occur, and calculate the total probability of failure based on those assumptions.</p> | <p>Mangata Networks acknowledges this proposed requirement, and will comply upon codification into the FCC's Part 25 rules.</p> |
| <p>(d)(14)(iv)(A)(2) The statement must identify characteristics of the space station(s)' orbits that may present a collision risk, including any planned and/or operational space stations in those orbits, and indicate what steps, if any, have been taken to coordinate with the other spacecraft or system, or what other measures the operator plans to use to avoid collision</p> | <p>Mangata Networks will comply. See Technical Narrative Section II.C</p> |
| <p>(d)(14)(iv)(A)(3) If at any time during the space station(s)' mission or de-orbit phase the space station(s) will transit through the orbits used by any inhabitable spacecraft, including the International Space Station, the statement must describe the design and operational strategies, if any, that will be used to minimize the risk of collision and avoid posing any operational</p> | |

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| constraints to the inhabitable spacecraft. | |
| (d)(14)(iv)(A)(4) The statement must disclose the accuracy, if any, with which orbital parameters will be maintained, including apogee, perigee, inclination, and the right ascension of the ascending node(s). In the event that a system is not able to maintain orbital tolerances, e.g., its propulsion system will not be used for orbital maintenance, that fact must be included in the debris mitigation disclosure. Such systems must also indicate the anticipated evolution over time of the orbit of the proposed satellite or satellites. All systems must describe the extent of satellite maneuverability, whether or not the space station design includes a propulsion system. | |
| Proposed - (d)(14)(iv)(A)(4) The statement must disclose the accuracy, if any, with which orbital parameters will be maintained, including apogee, perigee, inclination, and the right ascension of the ascending node(s). In the event that a system will not maintain orbital tolerances, e.g., its propulsion system will not be used for orbital maintenance, that fact should be included in the debris mitigation disclosure. Such systems must also indicate the anticipated evolution over time of the orbit of the proposed satellite or satellites. All systems should describe the extent of satellite maneuverability, whether or not the space station design includes a propulsion system. For space stations deployed into the portion of the low-Earth orbit region above 400 km, the operator must certify that the space stations will be designed with the maneuvering capabilities sufficient to perform effective collision avoidance throughout the period when the space stations are above 400 km | Mangata Networks acknowledges this proposed requirement, and will comply upon codification into the FCC's Part 25 rules. |
| (d)(14)(iv)(A)(5) The space station operator must certify that upon receipt of a space situational awareness conjunction warning, the operator will review and take all possible steps to assess the collision risk, and will mitigate the collision risk if necessary. As appropriate, steps to assess and mitigate the collision risk should include, but are not limited to: contacting the operator of any active spacecraft involved in such a warning; sharing ephemeris data and other appropriate operational information with any such operator; and modifying space station attitude and/or operations. | Mangata Networks will comply. See Technical Narrative Section II.C |
| (d)(14)(v) A statement addressing the trackability of the space station(s). Space station(s) operating in low-Earth orbit will be presumed trackable if each individual space station is 10 cm or larger in its smallest dimension, excluding deployable | See Technical Narrative Section II.C |

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| <p>components. Where the Federal Communications Commission FCC 20-54 102 application is for an NGSO space station or system, the statement shall also disclose the following:</p> | |
| <p>(d)(14)(v)(A) How the operator plans to identify the space station(s) following deployment and whether space station tracking will be active or passive;</p> | |
| <p>(d)(14)(v)(B) Whether, prior to deployment, the space station(s) will be registered with the 18th Space Control Squadron or successor entity; and</p> | |
| <p>(d)(14)(v)(C) The extent to which the space station operator plans to share information regarding initial deployment, ephemeris, and/or planned maneuvers with the 18th Space Control Squadron or successor entity, other entities that engage in space situational awareness or space traffic management functions, and/or other operators.</p> | |
| <p>(d)(14)(vi) A statement disclosing planned proximity operations, if any, and addressing debris generation that will or may result from the proposed operations, including any planned release of debris, the risk of accidental explosions, the risk of accidental collision, and measures taken to mitigate those risks.</p> | |
| <p>(d)(14)(vii) A statement detailing the disposal plans for the space station, including the quantity of fuel—if any—that will be reserved for disposal maneuvers. In addition, the following specific provisions apply:</p> | |
| <p>(d)(14)(vii)(B) For space stations terminating operations in an orbit in or passing through the low-Earth orbit region below 2,000 km altitude, the statement must disclose whether the spacecraft will be disposed of through atmospheric re-entry, specifying if direct retrieval of the spacecraft will be used. The statement must also disclose the expected time in orbit for the space station following the completion of the mission.</p> | |
| <p>(d)(14)(vii)(C) For space stations not covered by either (A) or (B), the statement must indicate whether disposal will involve use of a storage orbit or long-term atmospheric re-entry and rationale for the selected disposal plan.</p> | |
| <p>(d)(14)(vii)(D) For all space stations under (B) or (C), the following additional specific provisions apply:</p> | |
| <p>(d)(14)(vii)(D)(1) The statement must include a demonstration that the probability of success of the chosen disposal method will be 0.9 or greater for any individual space station. For space station systems consisting of multiple space stations, the demonstration should include additional information regarding</p> | |

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| | <p>efforts to achieve a higher probability of success, with a goal, for large systems, of a probability of success for any individual space station of 0.99 or better. For space stations under (B), successful disposal is defined as atmospheric re-entry of the spacecraft within 25 years or less following completion of the mission. For space stations under (C), successful disposal will be assessed on a case-by-case basis.</p> <p>(d)(14)(vii)(D)(2) If planned disposal is by atmospheric re-entry, the statement must also include:</p> <p>(d)(14)(vii)(D)(2)(a) A disclosure indicating whether the atmospheric re-entry will be an uncontrolled re-entry or a controlled targeted reentry.</p> <p>(d)(14)(vii)(D)(2)(b) An assessment as to whether portions of any individual spacecraft will survive atmospheric re-entry and impact the surface of the Earth with a kinetic energy in excess of 15 joules, and demonstration that the calculated casualty risk for an individual spacecraft using the NASA Debris Assessment Software or a higher fidelity assessment tool is less than 0.0001 (1 in 10,000).</p> | |
| | <p>Proposed - (d)(14)(vii)(D)(2)(b) An assessment as to whether portions of any individual spacecraft will survive atmospheric re-entry and impact the surface of the Earth with a kinetic energy in excess of 15 joules, and demonstration that the calculated casualty risk for an individual spacecraft using the NASA Debris Assessment Software or a higher fidelity assessment tool is less than 0.0001 (1 in 10,000). For systems consisting of multiple space stations, the statement must also include an assessment of the total casualty risk associated with the system, calculated as the sum of the casualty risk associated with each individual space station. The total estimated number of space stations deployed over a 15-year period, including any replacement space stations, must be used for this calculation. For applications for either a single space station or multiple space stations, where portions of any individual spacecraft will survive atmospheric re-entry and impact the surface of the Earth with a kinetic energy in excess of 15 joules, the statement must also include a description of strategies considered to reduce casualty risk, such as use of materials designed to demise upon reentry and/or targeted re-entry, and the extent to which those strategies were incorporated into the mission profile.</p> | <p>Mangata Networks acknowledges this proposed requirement, and will comply upon codification into the FCC's Part 25 rules.</p> |

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| | <p>Proposed - (d)(14)(viii) Applicants must submit a signed statement stating that the licensee will be responsible for indemnifying the United States against any costs associated with a claim brought under a provision of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies or Convention on International Liability for Damage Caused by Space Objects related to the facilities that are the subject of the license.</p> <p>Proposed - (d)(14)(ix) For non-U.S.-licensed space stations, the requirement to describe the design and operational strategies to minimize orbital debris risk can be satisfied either by submitting the information required of U.S.-licensed space stations, or by demonstrating that debris mitigation plans for the space station(s) for which U.S. market access is requested are subject to direct and effective regulatory oversight by the national licensing authority.</p> | Mangata Networks acknowledges this proposed requirement, and will comply upon codification into the FCC's Part 25 rules. |
| §25.118 Modifications not requiring prior authorization | (f) Repositioning of NGSO space stations. A licensee may reposition NGSO space stations within an authorized orbital plane without prior Commission approval, provided the licensee notifies the Commission of the repositioning 10 days in advance by electronic filing on Form 312 in the International Bureau Filing System. The notification must specify all changes in previously authorized parameters and must certify the following: | Mangata Networks will comply. |
| §25.121 License Term and Renewals | (d)(2) For NGSO space stations, the license period will begin at 3 a.m. Eastern Time on the date when the licensee notifies the Commission pursuant to 25.173(b) that operation of an initial space station is compliant with the license terms and conditions and that the space station has been placed in its authorized orbit. Operating authority for all space stations subsequently brought into service pursuant to the license will terminate upon its expiration | Mangata Networks will comply. |
| §25.137 Application requirements for earth stations operating with non-U.S. licensed space stations | (a) Earth station applications or entries filing a "letter of intent" or "Petition for Declaratory Ruling" requesting authority to operate with a non-U.S. licensed space station to serve the US must attach an exhibit with their FCC Form 312 application with information demoing that US-licensed satellite systems have effective competitive opportunities to provide analogous services in: (1) The country in which the non-US licensed space station is licensed and (2) All countries in which comms with the US ES will originate or terminate. The applicant bears the burden of showing that there are no practical or legal constraints | See Legal Narrative Section III |

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| | <p>that limit or prevent access of the U.S. satellite system in the relevant foreign markets. The exhibit required by this paragraph must also include a statement of why grant of the app is in the public interest. This paragraph shall not apply with respect to requests for authority to operate using a non-U.S. licensed satellite that is licensed by or seeking a license from a country that is a member of the World Trade Org for services covered under the World Trade Organization Basic Telecommunications Agreement</p> | |
| | <p>(b) Any request pursuant to paragraph (a) of this section must be filed electronically through the IB Filing system and must include an exhibit providing legal and technical info for the non-U.S.-licensed space station of the kind that 25.114 would require in a license application for that space station, including but not limited to, information required to complete Schedule S. An applicant may satisfy this requirement by cross-referencing a pending application containing the requisite info or by citing a prior grant of authority to communicate via space station in question in the same freq band to provide the same kind of service.</p> | <p>Mangata Networks will comply.</p> |
| | <p>(c) A non-U.S.-licensed NGSO-like satellite system seeking to serve the U.S. can be considered contemporaneously with other U.S. NGSO-like satellite systems pursuant to 25.157 and considered before later-filed applications of other U.S. satellite system operators, and a non-U.S.-licensed GSO-like satellite system seeking to serve the U.S. can have its request placed in a queue pursuant to 25.158 and considered before later-filed applications of other U.S. satellite system operators, if the non-U.S. licensed satellite system: (1) Is in orbit and operating; (2) Has a license from another administration; or (3) Has been submitted for coordination to the ITU.</p> | <p>Mangata Networks will comply.</p> |
| | <p>(d) Earth station applicants requesting authority to operate with a non-U.S.-licensed space station and non-U.S.-licensed satellite operators filing letters of intent or petitions for declaratory ruling to access the U.S. market must demonstrate that the non-U.S.-licensed space station has complied with all applicable Commission requirements for non-U.S. licensed systems to operate in the U.S., including but not limited to the following: (1) Milestone; (2) Reporting requirements; (3) Any other applicable service rules (4) The surety bond requirement in §25.165, for non-U.S.-licensed space stations that are not in orbit and operating. (5) Non-U.S. licensed GSO-like space</p> | <p>Mangata Networks will comply. See Legal Narrative Section III.D.1</p> |

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| | <p>station operators with a total of five requests for access to the U.S. market in a particular frequency band, or a total of five previously granted requests for access to the U.S. market with unbuilt GSO-like space stations in a particular frequency band, or a combination of pending GSO-like requests and granted requests for unbuilt GSO-like space stations in a particular frequency band that equals five, will not be permitted to request access to the U.S. market with another GSO-like space station license in that frequency band. In addition, non-U.S.-licensed NGSO-like satellite system operators with one request on file with the Commission in a particular frequency band, or one granted request for an unbuilt NGSO-like satellite system in a particular frequency band will not be permitted to request access to the U.S. market with another NGSO-like satellite system in the frequency band</p> | |
| <p>§25.146 Licensing and operating provisions for NGSO FSS space stations</p> | <p>(a) An NGSO FSS applicant proposing to operate in the 10.7-30 GHz frequency range must certify that it will comply with:</p> | <p>See Technical Narrative Section II.B</p> |
| | <p>(a)(1) Any applicable power flux-density levels in Article 21, Section V, Table 21-4 of the ITU Radio Regulations (incorporated by reference, § 25.108), except that in the 19.3-19.4 GHz and 19.6-19.7 GHz bands applicants must certify that they will comply with the ITU PFD limits governing NGSO FSS systems in the 17.7-19.3 GHz band; and</p> | |
| | <p>(a)(2) Any applicable equivalent power flux-density levels in Article 22, Section II, and Resolution 76 of the ITU Radio Regulations (both incorporated by reference, § 25.108).</p> | <p>See Technical Narrative Section II.D</p> |
| | <p>(b) In addition, an NGSO FSS applicant proposing to operate in the 10.7-12.7 GHz, 12.75-13.25 GHz, 13.75-14.5 GHz, 18.8-19.3 GHz, or 28.6-29.1 GHz bands must provide a demonstration that the proposed system is capable of providing FSS on a continuous basis throughout the fifty states, Puerto Rico, and the U.S. Virgin Islands.</p> | <p>See Technical Narrative Section I.B</p> |
| | <p>(c) Prior to the initiation of service, an NGSO FSS operator licensed or holding a market access authorization to operate in the 10.7-30 GHz frequency range must receive a “favorable” or “qualified favorable” finding by the ITU Radiocommunication Bureau, in accordance with Resolution 85 of the ITU Radio Regulations (incorporated by reference, § 25.108), regarding its compliance with applicable ITU EPFD limits. In addition, a market access holder in these bands must:</p> | <p>Mangata Networks will comply.</p> |
| | <p>(c)(1) Communicate the ITU finding to the Commission; and</p> | <p>Mangata Networks will comply.</p> |

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| | (c)(2) Submit the input data files used for the ITU validation software | Mangata Networks will comply. |
| | (e) An NGSO FSS licensee or market access recipient must ensure that ephemeris data for its constellation is available to all operators of authorized, in-orbit, co-frequency satellite systems in a manner that is mutually acceptable. | Mangata Networks will comply. |
| §25.156 Consideration of applications | (a) Applications for a radio station authorization, or for modification or renewal of an authorization, will be granted if, upon examination of the application, any pleadings or objections filed, and upon consideration of such other matters as it may officially notice, the Commission finds that the applicant is legally, technically, and otherwise qualified, that the proposed facilities and operations comply with all applicable rules, regulations and policies and that grant of the application will serve the public interest, convenience and necessity | See FCC Form 312, Schedule S, and associated application materials |
| | (d)(1) Applications for NGSO-like satellite systems will be considered pursuant to the procedures set forth in 25.157 | |
| | (d)(3) Applications for NGSO-like satellite and GSO-like systems employing two or more service bands will be treated like separate applications for each service band, and each service band request will be considered pursuant to 25.157 or 25.158, as appropriate. | To the extent necessary, Mangata Networks requests a waiver of 25.156(d)(3). See Legal Narrative III.D.2 |
| §25.157 Consideration of NGSO-like satellite applications | (c) Each NGSO-like satellite system application that is acceptable for filing will be reviewed to determine whether it is a "competing application," i.e., filed in response to a public notice initiating a processing round, or a "lead application," i.e., all other NGSO-like satellites system applications | To the extent necessary, Mangata Networks requests a waiver of 25.157(c) and 25.157(e). See Legal Narrative Section III.D.2 |
| | (c)(1) Competing applications that are acceptable for filing will be placed on public notice to provide interested parties an opportunity to file pleadings in response to the application pursuant to §25.154. | |
| | (c)(2) Lead applications that are acceptable for filing will be placed on public notice. This public notice will initiate a processing round, establish a cut-off date for competing NGSO-like satellite system applications, and provide interested parties an opportunity to file pleadings in response to the application pursuant to §25.154. | |
| | (e)(1) In the event that there is insufficient spectrum in the frequency band available to accommodate all the qualified applicants in a processing round, the available spectrum will be | |

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| | <p>divided equally among the licensees whose applications are granted pursuant to paragraph (d) of this section, except as set forth in paragraph (e)(2) of this section</p> <p>(e)(2) In cases where one or more applicants apply for less spectrum than they would be warranted under paragraph (e)(1) of this section, those applicants will be assigned the bandwidth amount they requested in their applications. In those cases, the remaining qualified applicants will be assigned the lesser of the amount of spectrum they requested in their applications, or the amount of spectrum that they would be assigned if the available spectrum were divided equally among the remaining qualified applicants.</p> | |
| <p>§25.164 System deployment time frame; milestone reporting</p> | <p>(b)(1) The recipient of an initial authorization for an NGSO satellite system, other than an SDARS system, must launch 50 percent of the maximum number of space stations authorized for service, place them in their assigned orbits, and operate them in accordance with the station authorization no later than 6 years after the grant of the authorization, unless a different schedule is established by Title 47, Chapter I. This paragraph does not apply to replacement NGSO space stations as defined in § 25.165(e).</p> <p>(2) A licensee that satisfies the requirement in paragraph (b)(1) of this section must launch the remaining space stations necessary to complete its authorized service constellation, place them in their assigned orbits, and operate each of them in accordance with the authorization no later than nine years after the grant of the authorization</p> <p>(f) A licensee subject to the requirements in paragraph (a) or (b) of this section must either demonstrate compliance with the applicable requirement or notify the Commission in writing that the requirement was not met, within 15 days after the specified deadline. Compliance with a milestone requirement in paragraph (a) or (b) of this section may be demonstrated by certifying pursuant to §25.121(d) that the space station(s) in question, has, or have, been launched and placed in the authorized orbital location or non-geostationary orbit(s) and that in-orbit operation of the space station or stations has been tested and found to be consistent with the terms of the authorization.</p> | <p>Mangata Networks will comply. See Legal Narrative Section D.I</p> |
| <p>§25.165 Surety Bonds</p> | <p>(a) In addition, Failure to post a bond will render the license null and void automatically</p> | <p>Mangata Networks will comply. See Legal Narrative Section D.I</p> |

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| | (a)(1) An NGSO licensee must have on file a surety bond requiring payment in the event of default as defined in paragraph (c) of this section, in an amount, at a minimum, determined according to the following formula, with the resulting dollar amount rounded to the nearest \$10,000: $A = \$1,000,000 + \$4,000,000 * D / 2192$, where A is the amount to be paid and D is the lesser of 2192 or the number of days that elapsed from the date of license grant until the date when the license was surrendered | |
| §25.202 Frequencies, frequency tolerance, and emission limits | (a)(1) In addition to the frequency-use restrictions set forth in §2.106 of this chapter, the following restrictions apply: | Mangata Networks will comply, or will seek waiver. See Legal narrative Section III.D.2 |
| | (a)(1)(i) In the 27.5-28.35 GHz band, the FSS (Earth-to-space) is secondary to the Upper Microwave Flexible Use Service authorized pursuant to part 30 of this chapter, except for FSS operations associated with earth stations authorized pursuant to §25.136. | |
| | (a)(1)(ii) Use of the 37.5-40 GHz band by the FSS (space-to-Earth) is limited to individually licensed earth stations. Earth stations in this band must not be ubiquitously deployed and must not be used to serve individual consumers. | Mangata Networks will comply. See Technical Narrative Section I.C and Schedule S |
| | (e) The carrier frequency of each space station transmitter authorized in these services shall be maintained within 0.002 percent of the reference frequency | |
| | (f) The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the schedule set forth in paragraphs (f)(1) through (f)(4) of this section. | |
| | (f)(1) In any 4 kHz band, the center frequency of which is removed from the assigned frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: 25 dB | |
| | (f)(2) In any 4 kHz band, the center frequency of which is removed from the assigned frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: 35 dB | |
| | (f)(3) In any 4 kHz band, the center frequency of which is removed from the assigned frequency by more than 250 percent of the authorized bandwidth: An amount equal to 43 dB plus 10 times the logarithm (to the base 10) of the transmitter power in watts; | |
| (f)(4) In any event, when an emission outside the authorized bandwidth causes harmful interference, the Commission may, at | Mangata Networks will comply. | |

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| | its discretion, require greater attenuation than specified in paragraphs (f)(1), (2) and (3) of this section | |
| | (g)(1) Telemetry, tracking, and command signals may be transmitted in frequencies within the assigned bands that are not at a band edge only if the transmissions cause no greater interference and require no greater protection from harmful interference than the communications traffic on the satellite network or have been coordinated with operators of authorized co-frequency space stations at orbital locations within six degrees of the assigned orbital location. | Mangata Networks has selected TT&C frequencies at the band edge. |
| | (g)(2) Frequencies, polarization, and coding of telemetry, tracking, and command transmissions must be selected to minimize interference into other satellite networks. | Mangata Networks will comply. |
| §25.207 Cessation of emissions | Space stations shall be made capable of ceasing radio emissions by the use of appropriate devices (battery life, timing devices, ground command, etc.) that will ensure definite cessation of emissions | See Technical Narrative Section I.C. |
| §25.208 Power flux-density limits | (r) In the band 37.5-40.0 GHz, the power flux-density at the Earth's surface produced by emissions from a non-geostationary space station for all methods of modulation shall not exceed the following values: (1) -132 dB(W/m ²) in any 1 MHz band for angles of arrival between 0 and 5 degrees above the horizontal plane; -132 + 0.75 (delta-5) dB(W/m ²) in any 1 MHz band for angles of arrival delta (in degrees) between 5 and 25 degrees above the horizontal plane; and -117 dB(W/m ²) in any 1 MHz band for angles of arrival between 25 and 90 degrees above the horizontal plane; | Mangata Networks complies with the relevant PFD limits put forth in Section 25.208. See Technical Narrative Section II.B |
| | (r)(2) This limit relates to the maximum PFD which would be obtained anywhere on the surface of the Earth during periods when FSS system raises power to compensate for rain-fade conditions at the FSS ES: -120 dB(W/m ²) in any 1 MHz band for angles of arrival between 0 and 5 degrees above the horizontal plane; -120 + 0.75(delta-5) dB(W/m ²) in any 1 MHz band for angles of arrival delta (in degrees between 5 and 25 degrees above the horizontal plane; and -105 dB(W/m ²) in any 1 MHz band for angles of arrival between 25 and 90 degrees above the horizontal plane. Note to paragraph (r): The conditions under which satellites may exceed these power flux-density limits for normal free space propagation described in paragraph (q)(1) to compensate for the effects of rain fading are under study and have therefore not yet been defined. Such conditions and the extent to which these limits can be exceeded | |

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| | <p>will be the subject of a further rulemaking by the Commission on the satellite service rules.</p> <p>(s) In the 40.0 - 40.5 GHz band, the PFD at the Earth's surface produced by emissions from a space station for all conditions and for all methods of modulation shall not exceed the following values: -115 dB(W/m²) in any 1 MHz band for angles of arrival between 0 and 5 degrees above the horizontal plane; -115 + 0.5 (δ-5) dB(W/m²) in any 1 MHz band for angles of arrival δ (in degrees) between 5 and 25 degrees above the horizontal plane; and -105 dB(W/m²) in any 1 MHz band for angles of arrival between 25 and 90 degrees above the horizontal plane; Note to paragraph (s): These limits relate to the power flux-density that would be obtained under assumed free-space propagation conditions.</p> <p>(t) In the band 40.5 - 42 GHz, the PFD at the Earth's surface produced by emissions from a NGSO space station for all conditions and for all methods of modulation shall not exceed the following values: -115 dB(W/m²) in any 1 MHz band for angles of arrival between 0 and 5 degrees above the horizontal plane; -115 + 0.5 (δ-5) dB(W/m²) in any 1 MHz band for angles of arrival δ (in degrees) between 5 and 25 degrees above the horizontal plane; and -105 dB(W/m²) in any 1 MHz band for angles of arrival between 25 and 90 degrees above the horizontal plane; Note to paragraph (t): These limits relate to the power flux density that would be obtained under assumed free-space propagation conditions.</p> | |
| <p>§25.210 Technical requirements for space stations</p> | <p>(f) All space stations in the FSS operating in any portion of the 3600 - 4200 MHz, 5091 - 5250 MHz, 5850 - 7025 MHz, 10.7 - 12.7 GHz, 12.75 - 13.25 GHz, 13.75 - 14.5 GHz, 15.43 - 15.63 GHz, 18.3-20.2 GHz, 24.75 - 25.25 GHz, or 27.5 - 30 GHz band, including feeder links for other space services and in the BSS in the 17.3 - 17.8 GHz band (space-to-Earth) shall employ state-of-the-art full frequency reuse, either through the use of orthogonal polarizations within the same beam and/or the use of spatially independent beams. This requirement does not apply to telemetry, tracking and command operation</p> | <p>See Technical Narrative Section II.C</p> |
| <p>§25.250 Sharing between NGSO MSS Feeder links and ES in the 19.3 - 19.7 GHz and</p> | <p>(a) NGSO MSS applicants shall be licensed to operate in the 29.1 - 29.5 GHz band for Earth-to-space transmissions and 19.3 - 19.7 GHz for space-to-Earth transmissions from feeder link earth station complexes. A "feeder link earth station complex" may include up to three (3) earth station groups, with each station group having up to four (4) antennas, located within a</p> | <p>Mangata Networks will comply. See Technical Narrative Section E</p> |

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| <p>29.1 - 29.5 GHz bands</p> | <p>radius of 75 km of a given set of geographic coordinates provided by NGSO-MSS licensees or applicants</p> <p>(b) Licensees of NGSO MSS feeder link earth stations separated by 800 km or less are required to coordinate their operations, see 25.203. The results of the coordination shall be reported to the Commission</p> | |
| <p>§25.257 Special requirements for NGSO MSS operations in the 29.1-29.25 GHz band regarding LMDS</p> | <p>(a) NGSO MSS operators shall be licensed to use the 29.1 - 29.5 GHz band for Earth-to-space transmission from feeder link earth station complexes. A "feeder link earth station complex" may include up to three (3) earth station groups, with each earth station group having up to four (4) antennas, located within a radius of 75 km of a given set of geographic coordinates provided by a NGSO MSS licensees or applicants pursuant to 101.147</p> <p>(b) A maximum of seven (7) feeder link earth station complexes in the contiguous U.S., Alaska, and Hawaii may be placed into operation, in the largest 100 MSAs, in the band 29.1 - 29.25 GHz in accordance with 25.203 and 101.147 of this chapter</p> <p>(c) One of the NGSO MSS operators licensed to use the 29.1 - 29.25 GHz band may specify geographic coordinates for a maximum of eight feeder link earth station complexes that transmit in the 29.1 - 29.25 GHz band. The other NGOS MSS operator licensed to use the 29.1 - 29.25 GHz band may specify geographic coordinates for a maximum of two feeder link earth station complexes that transmit in the 29.1 - 29.25 GHz band</p> <p>(d) Additional NGSO MSS operators may be licensed in this band if the additional NGSO MSS operator shows that its system can share with the existing NGSO MSS systems</p> <p>(e) All NGSO MSS operators shall cooperate fully and make reasonable efforts to identify mutually acceptable locations for feeder link earth station complexes. In this connection, any single NGSO MSS operator shall only identify one feeder link earth station complex protection zone in each category identified in 101.147.c.2 of this chapter until the other NGSO MSS operator has been given an opportunity to select a location from the same category</p> | |
| <p>§25.261 Sharing among NGSO FSS space stations</p> | <p>(a) Scope. This section applies to NGSO FSS operation with earth stations with directional antennas anywhere in the world under a Commission license, or in the United States under a grant of U.S. market access.</p> | <p>Mangata Networks will comply. See Legal Narrative Section III.B,</p> |

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| | <p>(b) Coordination. NGSO FSS operators must coordinate in good faith the use of commonly authorized frequencies.</p> <p>(c) Absent coordination between two or more satellite systems, whenever the increase in system noise temperature of an earth station receiver, or a space station receiver for a satellite with onboard processing, of either system, $\Delta T/T$, exceeds 6 percent due to interference from emissions originating in the other system in a commonly authorized frequency band, such frequency band will be divided among the affected satellite networks in accordance with the following procedure:</p> <p>(c)(1) Each of n (number of) satellite networks involved must select 1/n of the assigned spectrum available in each of these frequency bands. The selection order for each satellite network will be determined by the date that the first space station in each satellite system is launched and capable of operating in the frequency band under consideration;</p> <p>(c)(2) The affected station(s) of the respective satellite systems may operate in only the selected (1/n) spectrum associated with its satellite system while the $\Delta T/T$ of 6 percent threshold is exceeded;</p> <p>(c)(3) All affected station(s) may resume operations throughout the assigned frequency bands once the threshold is no longer exceeded.</p> | <p>Section III.D.2 and Technical Narrative Section E.</p> |
| <p>§25.271 Control of transmitting station</p> | <p>(a) The licensee of a facility licensed under this part is responsible for the proper operation and maintenance of the station</p> <p>(d) The licensee shall ensure that the licensed facilities are properly secured against unauthorized access or use whenever an operator is not present at the transmitter. For space station operations, this includes securing satellite commands against unauthorized access and use.</p> | <p>Mangata Networks will comply. See Technical Narrative Section I.A</p> |
| <p>§25.272 General inter-system coordination procedures</p> | <p>(a) Each space station licensee in the FSS shall establish a satellite network control center which will have the responsibility to do the following:</p> <p>(a)(1) Monitor space-to-Earth transmissions in its system (thus indirectly monitoring uplink earth station transmission in its system) and</p> <p>(a)(2) Coordinate transmissions in its satellite system with those of other systems to prevent harmful interference incidents or, in the event of a harmful interference incident, to identify the source of the interference and correct the problem promptly</p> | <p>Mangata Networks will comply. See Technical Narrative Section I.A</p> |

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| | (d)(5) The space station licensee may delegate the responsibility and duties of the satellite network control center to a technically qualified user or group of users, but the space station licensee shall remain ultimately responsible for the performance of those duties | |
| §25.273 Duties regarding space communications transmissions | (a) No person shall: | Mangata Networks will comply. |
| | (a)(1) Transmit to a satellite unless the specific transmission is first authorized by the satellite network control center; | |
| | (a)(2) Conduct transmissions over a transponder unless the operator is authorized to transmit at that time by the satellite licensee or the satellite licensee's successor in interest; or | |
| | (a)(3) Transmit in any manner that causes unacceptable interference to authorized transmission of another licensee | |
| | (b) Satellite operators shall provide upon request by the Commission and by earth station licensees authorized to transmit on their satellites relevant information needed to avoid unacceptable interference to other users, including the polarization angles for proper illumination of a given transponder. | |
| | (c) Space station licensees are responsible for maintaining complete and accurate technical details of current and planned transmissions over their satellites, and shall require that authorized users of transponders on their satellites, whether by tariff or contract, provide any necessary technical information in this regard including that required in 25.272. Based on this information, space station licensees shall exchange among themselves general technical information concerning current and planned transmission parameters as needed to identify and promptly resolve any potential cases of unacceptable interference between their satellite systems | |
| §25.275 Particulars of operation | (b) When authorized frequency bands are specified in the station authorization, the licensee is authorized to transmit any number of r.f. carriers on any discrete frequencies within an authorized frequency band in accordance with the other terms and conditions of the authorization and the requirements of this part. Specific r.f. carrier frequencies within the authorized frequency band shall be selected by the licensee to avoid unacceptable levels of interference being caused to other earth, space or terrestrial stations. Any coordination agreements, both domestic | Mangata Networks will comply. |

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| | and international, concerning specific frequency usage constraints, including non-use of any particular frequencies within the frequency bands listed in the station authorization, are considered to be conditions of the station authorization. | |
| §25.278 Additional coordination obligation for NGSO and GSO systems allocated to the FSS | Licenses of NGSO satellite systems that use frequency bands allocated to the FCC for their feeder link operations shall coordinate their operations with licenses of GSO FSS systems licensed by the Commission for operation in the same frequency bands. Licenses of GSO FSS systems in the frequency bands that are licensed to NGSO systems for feeder link operations shall coordinate their operations with the licenses of such NGSO systems | Mangata Networks will comply. |
| §25.283 End-of-life disposal | (c) Upon completion of any relocation authorized by paragraph (b) of this section, or any relocation at end-of-life specified in an authorization, or upon a spacecraft otherwise completing its authorized mission, a space station licensee shall ensure, unless prevented by technical failures beyond its control, that all stored energy sources onboard the satellite are discharged, by venting excess propellant, discharging batteries, relieving pressure vessels, and other appropriate measures | Mangata Networks will comply. |
| §25.289 Protection of GSO networks by NGSO systems | Unless otherwise provided in this chapter, an NGSO system licensee must not cause unacceptable interference to, or claim protection from, a GSO FSS or GSO BSS network. An NGSO FSS licensee operating in compliance with the applicable equivalent power flux-density limits in Article 22, Section II of the ITU Radio Regulations (incorporated by reference, §25.108) will be considered as having fulfilled this obligation with respect to any GSO network. | See Technical Narrative Section II.D |