O3b Limited (“O3b”) hereby files reply comments in connection with the Commission’s Further Notice of Proposed Rulemaking in the above-referenced proceeding.¹ In this filing, O3b asks that the Commission:

(1) revise Section 25.115(e) of the rules to clarify that blanket licensing is available in the 18.8-19.3 GHz and 28.6-29.1 GHz bands, in which NGSO systems are primary, for earth stations that communicate with NGSO systems;

(2) allow unlicensed receive-only earth stations to receive signals from any non-U.S.-licensed space station that has been approved for U.S. market access under Section 25.137 of the rules, not just those included on the Permitted List; and

(3) revise Section 25.132 of the rules to clarify what measurement data is required for asymmetric antennas operating with a skew angle and to require additional measurements on flat-plate antennas to determine worst-case sidelobes.

Blanket licensing of earth stations communicating with NGSO space stations. In the *FNPRM*, the Commission proposed changes to Section 25.115(e), which establishes procedures for blanket licensing of earth stations in certain bands. At present, Section 25.115(e) identifies only bands in which GSO earth stations are primary as eligible for blanket licensing. O3b asks that Section 25.115(e) be revised to clarify that blanket licensing also is available in the 18.8-19.3 GHz and 28.6-29.1 GHz bands, in which NGSO systems are primary, for earth stations that communicate with NGSO systems. This clarification would be consistent with the Commission’s statements on multiple occasions that it will accept applications for blanket licenses in these bands for earth stations that will communicate with NGSO systems.

Unlicensed receive-only earth stations. O3b is in favor of the Commission’s proposal in the *FNPRM*, based on a suggestion from SIA, “to allow unlicensed receive-only earth stations to receive signals from any non-U.S.-licensed space station that has been approved for U.S. market access under Section 25.137, not just those included on the Permitted List.” Inmarsat supported the Commission’s proposal and reasoning on this issue in its comments; O3b concurs. Adopting the proposal will make it easier for antenna manufacturers to test equipment in receive-only mode, which is a common practice. Adopting the proposal also will facilitate monitoring of space station beacons without having to draw upon the Commission’s scarce resources.

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2 See *FNPRM*, ¶ 143.
3 See Redesignation of Ka-band R & O at ¶6; In the Matter of Northrop Grumman Space & Mission Systems Corporation: Applications for Authority to Operate a Global Satellite System Employing Geostationary Satellite Orbit and Non-Geostationary Satellite Orbit Satellites in the Fixed-Satellite Service in the Ka-band and V-band, 24 FCC Red 2330, ¶69 n.35 (Chief IB 2009); In the Matter of contactMEO Communications, LLC, For Authority to Launch and Operate a Non-Geostationary Orbit Fixed-Satellite System in the Ka-band Frequencies, 21 FCC Red 4035, ¶20 n.57 (Chief IB 2006).
4 *FNPRM*, ¶ 164.
5 Comments of Inmarsat at 6.
**Skew angles, asymmetric antennas, and flat-plate antennas.** In the FNPRM, the Commission proposes to eliminate the requirement in Section 25.209(a)(5) to operate an elliptical (i.e., asymmetric) earth station antenna only with its major axis aligned with the plane of the GSO orbit and instead to allow such asymmetric antennas to be operated up to some maximum skew angle that is defined by the operator.\(^6\) The rationale for this is that the off-axis EIRP requirement along the GSO arc provides an incentive to maximize this alignment anyway. Removing this requirement is acceptable.

However, the Commission, as well as various commenters to the FNPRM, have proposed changes to Sections 25.209 and 25.132 which could create some ambiguity as to what measurement data is actually required for asymmetric antennas operating with a skew angle.\(^7\) Of particular concern is the wording of proposed new rule Section 25.132(b)(1)(iv) which could be interpreted as requiring that the off-axis gain be measured only in directions corresponding to the worst-case skew angle that will be used in practice. This proposed rule states:

Section 25.132(b)(1)(iv): For antennas with asymmetric apertures or beams, where the minor axis of the antenna beam (major axis of the antenna aperture) will not always be aligned parallel to the plane tangent to the GSO arc, measurements must be made at the worst-case skew angle at which the antenna will operate.

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\(^6\) FNPRM at 98.

\(^7\) The Commission proposes “to require the gain and off-axis EIRP density of antennas with axially asymmetric radiation patterns to be measured and specified at the worst-case skew angles at which the antennas will operate” FNPRM at 98.
In fact what this rule means in O3b’s opinion is that the two sets of orthogonal measurements required in Sections 25.132(b)(1)(i)(A) and 25.132(b)(1)(i)(B) should still be made for such antennas but with the reference point for the definition of “azimuth” and “elevation” corresponding to the case of maximum skew angle. O3b therefore proposes that the wording of Section 25.132(b)(1)(iv) be changed to read as follows in order to clarify this:

Section 25.132(b)(1)(iv): For antennas with asymmetric apertures or beams, where the minor axis of the antenna beam (major axis of the antenna aperture) will not always be aligned parallel to the plane tangent to the GSO arc, measurements must be made in the two orthogonal planes referred to in Sections 25.132(b)(1)(i)(A) and 25.132(b)(1)(i)(B) at the worst-case skew angle at which the antenna will operate.

O3b is additionally concerned at the loss of useful measured data on flat-plate antennas which is captured by the current rules, but which would be lost by the proposed changes to Sections 25.209 and 25.132, and which has also been raised by the Commission as a potential issue. Flat-plate antennas, because of their use of phased array elements, tend to produce their worst-case sidelobes in particular directions that are not necessarily orthogonal to their main axis. Some arrays, for example, produce a string of high level sidelobes at 45 degrees to the main axis. Such antennas therefore do not have monotonically increasing sidelobe levels as the direction is changed from the major to the minor axis. This means that the measurement of such antennas in two orthogonal planes only, as required by the proposed new Sections 25.209 and 25.132, would likely end up missing the worst-case sidelobe levels that occur in some direction other than the two orthogonal ones measured. O3b therefore proposes that additional

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8 The Commission “invites comment as to whether a further requirement should be adopted for measuring the gain patterns of flat-plate antennas and, if so, what requirement would be appropriate for this purpose.” FNPRM at 106.
measurements be required on such flat-plate antennas to determine the worst-case sidelobes, by means of the following further modification to Section 25.132(b)(1)(iv).

Section 25.132(b)(1)(iv): For antennas with asymmetric apertures or beams, where the minor axis of the antenna beam (major axis of the antenna aperture) will not always be aligned parallel to the plane tangent to the GSO arc, measurements must be made in the two orthogonal planes referred to in 25.132(b)(1)(i)(A) and 25.132(b)(1)(i)(B) at the worst-case skew angle at which the antenna will operate. In addition, the applicant must determine the direction or directions in which the worst case sidelobes occur and provide measured data of the gain in these directions over a range of off-axis angles of ±90 degrees.

Conclusion. In summary, O3b urges the Commission to revise Section 25.115(e) of the rules to clarify the availability of blanket licensing for earth stations of primary NGSO systems in the 18.8-19.3 GHz and 28.6-29.1 GHz bands, permit receipt of signals by receive-only earth stations from market-access-approved non-U.S.-licensed space station, and revise Section 25.132 of the rules, both to clarify what measurement data is required for asymmetric antennas operating with a skew angle and to require additional measurements on flat-plate antennas to determine
worst-case sidelobes. The proposed changes will help reduce demands on the Commission’s scarce resources, and will clarify the measurements required for asymmetric earth station antennas to ensure that new technology antennas, such as flat-plates, are correctly characterized as far as their interference environment is concerned.

Respectfully submitted,

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