Before the FEDERAL COMMUNICATIONS COMMISSION Washington, D.C. 20554

In the Matter of)
DIRECTV Enterprises, LLC)
Amendment to DIRECTV KU-45W Application)

File No. SAT-AMD-20130716-00094 Call Sign S2893

COMMENTS OF SES SATELLITES (GIBRALTAR) LIMITED

SES Satellites (Gibraltar) Limited ("SES") hereby comments on the abovecaptioned DIRECTV amendment to its application for a new Ku-band spacecraft at the 45.2° W.L. orbital location (the "DIRECTV Amendment"). Specifically, SES asks the Commission to include in any grant of the DIRECTV Amendment standard condition language requiring DIRECTV to comply with the power levels specified in Section 25.212 of the Commission's rules unless higher power levels have been coordinated with potentially affected systems. In addition, the Commission should require DIRECTV to correct the interference analysis provided in support of the amendment.

SES operates several satellites in the vicinity of DIRECTV's requested orbital location of 45.2° W.L., including the NSS-703 satellite less than two degrees away at 47.05° W.L. As a result, SES has a clear interest in ensuring that DIRECTV's operations conform to Commission requirements.¹ DIRECTV asserts that its proposed satellite "will remain in compliance with the relevant technical rules established by the Commission" and "will operate successfully within the two-degree spacing environment established by the

¹ SES previously expressed concern about the adequacy of the interference analysis submitted by DIRECTV. *See* Informal Comments of SES Satellites (Gibraltar) Limited, File No. SAT-LOA-20130205-00016, filed June 18, 2013. DIRECTV states that the amendment "more fully addresses" the issues SES raised in its informal comments. *See* DIRECTV Amendment, Introductory Narrative at 1 n.3.

Commission's policy and implementing rules." Review of the amendment, however, casts doubt on the accuracy of both these assertions.

Section 25.212 Downlink EIRP Density: For purposes of the two-degree compatibility demonstration required under Section 25.140(b) of the Commission's rules, a Kuband satellite applicant must (among other things) "provide an analysis demonstrating that the satellite's EIRP density and the earth station input power density values will not exceed and can operate at those levels listed in §25.212(c)."² DIRECTV, however, provides no such showing. Instead, DIRECTV assumes a peak downlink EIRP density of 53.5 dBW for 36 MHz transponders in its link budget,³ which exceeds by approximately 4 dB the maximum transmitted satellite EIRP density of +10 dBW/4 kHz specified under Section 25.212.⁴ If DIRECTV in fact plans to operate at levels exceeding the Section 25.212 limits, it must coordinate with neighboring satellites within six degrees on either side.⁵

The Commission has developed standard condition language reflecting these requirements and should apply that language if it authorizes DIRECTV's proposed operations at 45.2° W.L. Specifically, the Commission should include the following condition language in any grant of the DIRECTV Amendment:

DIRECTV shall comply with the power levels specified in Section 25.212 of the Commission's rules, 47 C.F.R. § 25.212, unless DIRECTV coordinates any

 ² International Bureau Satellite Division Information: Clarification of 47 C.F.R.
§ 25.140(b)(2), Space Station Application Interference Analysis, Public Notice No: SPB-195, DA 03-3863 (Dec. 3, 2003) at 2.

³ DIRECTV Amendment, Appendix A (specifying 53.5 dBW for satellite EIRP per 36 MHz); *See also id.*, Schedule S, Item S7(m) (listing maximum EIRP of 53.5 dBW for beams T1H, T1V, T2H, and T2V). SES notes that there is some inconsistency in the DIRECTV representations regarding this point -- in the narrative technical materials, DIRECTV states that the maximum downlink EIRP is 53 dBW. *See id.*, Narrative at 6, Section 5.2.2.

⁴ 47 C.F.R. § 25.212(c)(2).

⁵ See 47 C.F.R. § 25.212(e) & 47 C.F.R. § 25.220(d)(1).

operations using power levels exceeding the levels in Section 25.212 with all potentially affected adjacent satellites within 6 degrees orbital separation of the 45.2° W.L. orbital location. DIRECTV shall inform the Commission of the power levels it has coordinated. In addition, DIRECTV must inform all affected earth station operators that Section 25.220 of the Commission's rules, 47 C.F.R. § 25.220, applies to operations that exceed the power levels specified in Section 25.212.

Imposing this requirement is consistent with Commission precedent, as similar

language has been included in numerous satellite authorizations.⁶ Furthermore, as discussed in

pleadings relating to other satellites in the neighborhood of 45.2° W.L., this condition reflects the

Commission's fundamental two-degree spacing policy that applies to all space station

authorizations granted by the Commission.⁷ The condition regarding Section 25.212 compliance

typically includes language imposing maximum power levels that cannot be exceeded without

modification of the license, and such language is also appropriate here. Adoption of this

condition will ensure that any grant of the DIRECTV Amendment conforms to Commission

rules and policies on satellite power levels and provides a clear statement of DIRECTV's

regulatory responsibilities.

See, e.g., SES Americom, Inc., File No. SAT-MOD-20140207-00020, grant-stamped April 10, 2014, Attachment to Grant at 3, ¶ 15; New Skies Satellites B.V., File No. SAT-PPL-20120717-00117, grant-stamped Aug. 1, 2013, Attachment to Grant at 5, ¶ 20; Hispasat, S.A., File No. SAT-PPL-20130430-00064, grant-stamped Dec. 20, 2013, Attachment to Grant at 1, ¶ 4; Intelsat License LLC, File No. SAT-MOD-20120713-00110, grant-stamped May 21, 2014, Attachment to Grant at 2-3, ¶ 7; Intelsat License LLC, File No. SAT-MOD-20130322-00052, grant-stamped Oct. 23, 2013, Attachment to Grant at 2, ¶ 14; Intelsat License LLC, File No. SAT-RPL-20120216-00018, grant-stamped May 25, 2012, Attachment to Grant at 3, ¶ 13; Intelsat License LLC, File No. SAT-LOA-20110610-00105, grant-stamped Oct. 9, 2012, Attachment to Grant at 2, ¶ 7.

See Request for Clarification or, Alternatively, Petition for Reconsideration of Intelsat License LLC, File No. SAT-MPL-20130906-00114 (filed Jan. 6, 2014) (noting that a Commission grant of modified market access for NSS-806 at 47.5° W.L. appeared to have inadvertently omitted this condition and requesting that the language be added); Response of New Skies Satellites B.V., File No. SAT-MPL-20130906-00114 (filed Jan. 15, 2014) (consenting to the language requested by Intelsat); Informal Comments of New Skies Satellites B.V., File No. SAT-MOD-20121018-00184 (filed Jan. 31, 2014) (requesting inclusion of same condition in any grant of application for operation of Galaxy 11 at 44.8° W.L.).

C/I Calculation for 65 cm Antenna: There also appears to be an error in the calculations DIRECTV relies on to show that it will be able to successfully operate using 65 cm receive antennas. Specifically, Table 17-2, "Downlink C/I for 2° geocentric spacing vs. receive antenna size," provides an accurate on-axis gain for the 65 cm dish of 36.3 dBi, but the associated off-axis gain of 20.4 dB appears to be based on the incorrect assumption that this antenna conforms to the 29-25*log(θ) antenna off-axis gain pattern at 2.2 degrees. Given its wider main lobe beam, however, a 65 cm antenna has poorer off-axis performance and would exceed the 29-25*log(θ) mask at 2.2 degrees off axis (see Figure 1, below). Instead, using Recommendation ITU-R BO.1213 to approximate the main-lobe gain at 2.2 degrees yields a gain of roughly 28.4 dBi for this size antenna. Such a calculation produces a single-entry C/I of approximately 7.8 dB, rather than the 15.9 dB set forth in DIRECTV's table.



Figure 1 65 cm main-lobe antenna gain pattern at 11.7 GHz with 65% efficiency

The Commission should require DIRECTV to submit a new interference analysis that corrects these errors or revises the parameters for its planned operations, and to provide a recalculated link budget.⁸ DIRECTV's claim that it will be able to operate with an adequate margin using 65 cm antennas is expressly dependent on the erroneous C/I value of 15.9 dB.⁹ DIRECTV must show whether it can successfully close its links using the corrected C/I value of 7.8 dB. Based on SES's own calculations, SES questions whether DIRECTV can obtain the desired availability level of 99.7%¹⁰ using a 65 cm receive dish in a two-degree spacing environment. Instead, SES believes that antenna diameters of 90 cm or 1.2 m would be necessary to achieve 99.7% availability. If that is the case, DIRECTV must revise its technical data accordingly and clearly cannot claim that its 65 cm dishes are entitled to protection from future adjacent satellite operations that comply with the Commission's two-degree framework (unless coordinated).

⁸ In addition to making these corrections, DIRECTV should also provide a clarification regarding its proposed transmit beams. Specifically, the Schedule S submitted with the amendment refers to a "TXV" beam identifier in item S7, but there is no beam diagram or transponder information corresponding to that beam designation in items S8 and S10. *See* DIRECTV Amendment, Schedule S, Items S7, S8, and S10.

⁹ *See id.*, Narrative at 16.

¹⁰ *See id.*, Narrative at 9.

For the foregoing reasons, SES requests that the Commission include the

condition set forth above in any grant of the DIRECTV Amendment and require DIRECTV to correct its interference analysis.

Respectfully submitted,

SES Satellites (Gibraltar) Limited

By: <u>/s/ Daniel C.H. Mah</u>

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Dated: June 9, 2014

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DECLARATION

I, Zachary Rosenbaum, hereby certify under penalty of perjury that I am the technically qualified person responsible for preparation of the technical information contained in the foregoing comments; that I am familiar with the technical requirements of Part 25; and that I either prepared or reviewed the technical information contained in the comments and that it is complete and accurate to the best of my knowledge, information and belief.

/s/

Engineer, Spectrum Management and Development SES

Dated: June 9, 2014

CERTIFICATE OF SERVICE

I hereby certify that on this 9th day of June, 2014, a true copy of the foregoing

"Comments of SES Satellites (Gibraltar) Limited" is being sent by first class, U.S. Mail, postage

paid, to the following:

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