

EXHIBIT 1

DESCRIPTION OF PROPOSED MODIFICATION (Response to Questions 43)

Pursuant to 47 C.F.R. § 25.117 and Condition 8(1) of the Commission’s grant of license to operate EchoStar XXIV (also known as “Jupiter 3”), a very high throughput satellite in the Ka-, V-, and Q-bands,¹ Hughes Network Systems, LLC (with its affiliates, “Hughes”) submits this modification application to provide a detailed technical demonstration of interference protection afforded to Space Exploration Holdings, LLC’s (“SpaceX”) authorized non-geostationary orbit (“NGSO”) fixed satellite service (“FSS”) operations in the 18.8-19.3 GHz (downlink) and 28.6-29.1 GHz (uplink) frequency bands.

As an initial matter, Hughes has successfully reached coordination agreements with SpaceX and other NGSO operators to ensure Jupiter 3 operations at 18.8-19.3 GHz and 28.6-29.1 GHz on a non-harmful interference basis.² Specifically, the coordination agreement with SpaceX applies to Hughes’ Jupiter 1, 2, and 3 satellite operations, as well as to SpaceX’s NGSO operations pursuant to Norway filings (*i.e.*, STEAM-2 and STEAM-2B) with the International Telecommunication Union (“ITU”). To date, both parties have operated their respective satellite networks at 18.8-19.3 GHz and 28.6-29.1 GHz with no report of any harmful interference.

¹ Condition 8(1) of the Jupiter 3 license grant requires Hughes to “(1) notify the Commission in writing when an agreement has been reached with the NGSO satellite system operator [operating in the 18.8-19.3 GHz and 28.6-29.1 GHz], or (2) seek and obtain the Commission’s approval of a modification of this license including detailed technical demonstrations of how Hughes will protect the NGSO FSS satellite system.” *See* Hughes, *Stamp Grant*, IBFS File No. SAT-MOD-20200612-00072, Condition 8(1) (Sept. 3, 2020) (“*Jupiter 3 2020 Grant*”).

² Pursuant to Condition 8(1) of the Jupiter 3 license grant, Hughes is also filing notification of these coordination agreements concurrently herewith.

Although it remains unclear as to which portion of SpaceX's existing or future NGSO satellite constellation operates pursuant to its Norway ITU filings, the interference protection afforded under the parties' existing coordination agreement can and should be reasonably extended to any additional SpaceX NGSO operations at 18.8-19.3 GHz and 28.6-29.1 GHz. Nonetheless, in an abundance of caution, Hughes submits the attached technical demonstration (Attachment A) of interference protection for SpaceX's authorized NGSO FSS operations at 18.8-19.3 GHz and 28.6-29.1 GHz.

Specifically, using Visualyse Professional software and technical parameters based upon FCC-approved applications and ITU filings (including SpaceX's proposed arc avoidance of 22 degrees³), the attached technical analysis provides cumulative distribution function diagrams of interference-to-noise ("I/N") ratios at the victim receiver with a simulation duration of 15 days and a time step of one second. The analysis finds that any potential interference from Jupiter 3 to SpaceX NGSO network operations at 18.8-19.3 GHz and 28.6-29.1 GHz, in terms of I/N ratios and the associated link performance degradation of carrier-to-noise ("C/N") ratios, is negligible (*i.e.*, a maximum I/N of -16.4 dB and a C/N reduction of 0.098 dB for 0.0001% of the time). The analysis thus concludes that SpaceX NGSO operations at 18.8-19.3 GHz and 28.6-29.1 GHz will not suffer any significant effects of harmful interference from Jupiter 3 network operations.

Accordingly, the Commission should find that Condition 8(1) of the Jupiter 3 license grant is satisfied with respect to SpaceX's existing and future NGSO FSS operations at 18.8-19.3 GHz and 28.6-29.1 GHz.

³ See Space Exploration Holdings, LLC, IBFS File No. SAT-LOA-20161115-00118, Sections A.8.1.2 and A.8.1.3 (filed Nov. 16, 2016).