# Before the FEDERAL COMMUNICATIONS COMMISSION Washington, DC 20554

In the Matter of

Application of Hawaii Pacific Teleport, L.P. to Modify its Fixed Earth Station License To Operate a Gateway Earth Station in the 18.4-19.2 GHz (space-to-Earth) and 27.5-29.15 GHz (Earth-tospace) Frequency Bands with the Eutelsat E172B Satellite

) Call Sign: E150010 ) ) File No. \_\_\_\_\_)

# EARTH STATION MODIFICATION APPLICATION

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By this application, Hawaii Pacific Teleport, L.P. ("HPT") seeks to modify its existing fixed earth station license to operate a 9.2-meter gateway earth station – a General Dynamics Satcom Technologies 9.2m (the "ST-9.2m gateway") – at its facility in Kapolei, Hawaii. The ST-9.2m gateway will communicate with the recently launched Eutelsat 172B ("E172B") satellite, a French-licensed geostationary satellite orbit ("GSO") fixed-satellite service ("FSS") satellite owned by Eutelsat Asia Pte Ltd (referred to herein, together with its ultimate parent, Eutelsat Communications S.A., and intermediate entities, as "Eutelsat"). The E172B satellite will be located at the 172° E.L. orbital location and, among other communications capabilities, will operate gateway links in the Ka-band from 18.4-19.2 GHz (space-to-Earth) and 27.5-29.15 GHz (Earth-to-space).<sup>1</sup>

After supporting near-term in-orbit testing ("IOT") for the E172B satellite in the October 2017, time frame (which will be the subject of a separate HPT request for special temporary authority or "STA"), the ST-9.2m gateway will support long-term service

<sup>&</sup>lt;sup>1</sup> The spacecraft will also include a Ka-band beacon at 19.202 GHz, the parameters of which are included in this application.

provided by Eutelsat throughout the Pacific Ocean region using the E172B satellite on other frequency bands, including C-band (5925-6425 MHz, Earth-to-space; 3700-4200 MHz, space-to-Earth) and Ku-band (13.0-13.25 GHz, 13.75-14.0 GHz and 14.0-14.5 GHz, Earth-to-space; 10.95-11.20 GHz, 11.2-11.45 GHz, 11.45-11.7 GHz and 12.20-12.75 GHz, space-to-Earth) frequencies. HPT understands that some of these frequencies will be used to provide service only outside the United States, that Eutelsat is in discussions with the Commission regarding E172B licensing and coordination issues, and that Eutelsat will submit an appropriate request for authority to serve the U.S. market in the near term. This earth station application, however, is directed solely at obtaining authority for the ST-9.2m gateway to communicate with E172B for Ka-band gateway operations.

Because the E172B satellite has not been previously authorized to serve the United States, this application also requests that the Commission afford E172B U.S. market access for Ka-band gateway operations. As discussed herein, grant of the requested authority will serve the public interest by allowing HPT to provide important gateway earth station services to Eutelsat that will expand available satellite communications offerings and enhance competition in the United States and throughout the Pacific Ocean region.

#### I. DISCUSSION

The E172B satellite will operate at 172° E.L. in C-band, Ku-band and Ka-band frequencies to provide a range of broadband satellite services in the Pacific Ocean region. In the Ka-band frequencies relevant to this application, E172B will operate pursuant to the French F-SAT-N-172E filing, including by means of a small number of gateway spot beams, among them a Hawaii gateway beam. The companion Technical Appendix, FCC Form 312

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Schedule B and Schedule S contain relevant information relating to the E172B satellite, its Ka-band gateway communications payload and the proposed earth station operations.

#### A. The ST-9.2m Gateway Earth Station

The ST-9.2m gateway will operate at HPT's facility in Kapolei, Hawaii (geographic coordinates: 21° 20' 12" N, 158° 5' 25.2" W). The earth station antenna will be constructed on-site, as is usual for this size earth station. The operational parameters of the ST-9.2m gateway are set forth in the associated FCC Form 312.

Manufactured by General Dynamics Satcom Technologies, the ST-9.2m will comply with applicable off-axis EIRP spectral density limits in Section 25.138 of the Commission's rules and antenna performance requirements in Section 25.209 of the Commission's rules. In lieu of performance verification information antenna performance information for the 9.2m antenna is included as an attachment to the modification application. Should additional performance information be required, HPT requests a waiver to permit post-grant submission of such information because performance verification can only be conducted after antenna construction.

### **B. Ka-Band Spectrum Access Issues**

The U.S. Table of Allocations and the Commission's Ka-band Plan identify various spectrum allocations in the subject frequency bands.<sup>2</sup> The ST-9.2m gateway seeks to communicate with the E172B satellite in the following bands:

<sup>&</sup>lt;sup>2</sup> See United States Table of Frequency Allocations, 47 C.F.R. §2.106; In the Matter of Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services, 11 FCC Rcd. 19005, ¶¶ 57-58 and 78 (1996) ("Ka-band Plan R&O"). In the Matter of Redesignation of the 17.7-19.7 GHz Frequency Band, Blanket Licensing

| Table 1 - Gateway Frequencies |                         |   |
|-------------------------------|-------------------------|---|
| Frequency Band<br>(GHz)       | Function                | US Allocation                           |
| 27.5-28.35                    | Gateway Uplink          | UMFUS<br>fss (secondary)                |
| 28.35-28.6                    | Gateway Uplink          | GSO FSS Primary<br>ngso fss (secondary) |
| 28.6-29.1                     | Gateway Uplink          | NGSO FSS Primary<br>gso fss (secondary) |
| 29.1-29.15                    | Gateway Uplink          | LMDS Primary<br>Primary NGSO MSS FL     |
| 18.4-18.8                     | Gateway Downlink        | GSO FSS Primary                         |
| 18.8-19.2                     | <b>Gateway Downlink</b> | NGSO FSS Primary                        |

# a. 27.5-28.35 GHz Band

The Commission's Table of Allocations and Ka-band Plan provide that LMDS systems operate on a primary basis and FSS systems on a secondary basis in the 27.5-28.35 GHz (Earth-to-space) bands.<sup>3</sup> The Commission also recently adopted rules that make FSS secondary to the newly created Upper Microwave Flexible Use Service ("UMFUS") in the 27.5-28.35 GHz band.<sup>4</sup> The UMFUS framework allows for the expansion of mobile

of Satellite Earth Stations in the 17.7-20.2 GHz and 27.5-30.0 GHz Frequency Bands, and the Allocation of Additional Spectrum in the 17.3-17.8 GHz and 24.75-25.25 GHz Frequency Bands for Broadcast Satellite-Service Use, 15 FCC Rcd 13430, ¶ 28 and 34 (2000) ("Redesignation of Ka-band Plan R&O"); See also 47 C.F.R. § 25.136.

<sup>&</sup>lt;sup>3</sup> See Ka-band Plan R&O ¶¶ 59-62; see also Redesignation of Ka-band R&O ¶ 28.

<sup>&</sup>lt;sup>4</sup> See In the Matter of Use of Spectrum Bands Above 24 GHz for Mobile Radio Services, Establishing a More Flexible Framework to Facilitate Satellite Operations in the 27.5-28.35 GHz and 37.5-40 GHz Bands, et al., Report and Order and Further Notice of

operations and extended UMFUS rights and protections to existing LMDS licensees.<sup>5</sup> Under the new rules, FSS earth stations must demonstrate that they comply with minimum UMFUS interference protection criteria.<sup>6</sup>

The attached Comsearch coordination report demonstrates that HPT may operate the ST-9.2m gateway with E172B without causing harmful interference to LMDS licensees. HPT has completed coordination of its proposed Ka-band operations in the 27.5-28.35 GHz band with existing terrestrial licenses in the area and no objections were received from incumbent licensees.<sup>7</sup> Therefore, there are no LMDS interference concerns regarding the proposed use of the 27.5-28.35 GHz frequency band. As discussed below in Attachment C, operation of the ST-9.2m gateway also satisfies Section 25.136 of the Commission's rules to facilitate future UMFUS operations.

#### b. 28.35-28.6 GHz and 18.4-18.8 GHz Band

The Table of Allocations and Ka-band Plan provide that the 28.35-28.6 GHz (Earth-to-space) and 18.4-18.8 GHz (space-to-Earth) bands may be used by GSO FSS systems on a primary basis. HPT will operate the ST-9.2m gateway consistent with the GSO FSS allocation in these bands.

<sup>5</sup> *Id.* ¶ 41.

<sup>6</sup> *Id.* ¶ 54.

Proposed Rulemaking, FCC 16-89, ¶ 50 (2016) ("*Spectrum Frontiers Order*"). HPT notes that its proposed operations in the 27.5-28.35 GHz band are consistent with the Commission's view on the "gateway-type" FSS operations that would not cause harmful interference to primary LMDS stations in the band.

<sup>&</sup>lt;sup>7</sup> See Frequency Coordination Report.

HPT notes that Section 25.115 of the Commission's rules provides that earth stations proposing to receive in the 18.4-18.8 GHz bands can communicate only with satellites for which coordination has been completed pursuant to Footnote US334. HPT understands that Eutelsat is undertaking coordination of the E172B satellite with the U.S. Administration, including under Footnote US334. HPT notes that the Commission may grant this application conditioned upon completion of such coordination.<sup>8</sup>

Because this application effectively constitutes the first request for U.S. market access for the E172B satellite, to the extent it has not already begun, HPT respectfully suggests that coordination be commenced with the National Telecommunications and Information Administration ("NTIA") regarding the proposed ST-9.2m gateway operations. HPT understands that Eutelsat is prepared to support such coordination discussions expeditiously in furtherance of this application and that Eutelsat's preliminary compatibility assessment suggests coordination under US334 will be successful.

HPT certifies that it will operate consistently with the coordination agreement reached pursuant to Footnote US334 and otherwise will not cause interference to or claim protection from U.S. government operations in the 18.4-18.8 GHz band.

#### c. 28.6-29.1 GHz and 18.8-19.2 GHz Bands

The 28.6-29.1 GHz band is allocated to NGSO FSS on a primary basis and to the GSO FSS on a secondary basis. The 18.8-19.2 GHz band is allocated to NGSO FSS on a primary basis but there is no GSO FSS allocation, so HPT requests a waiver to operate in

<sup>&</sup>lt;sup>8</sup> See, e.g., Ka-Band Permitted Space Station List, available at <u>https://www.fcc.gov/ka-band-permitted-space-station-list</u> (exampled of conditional grant include ANIK F3 and Amazonas-3).

this band (see discussion in Section D below). In both cases, the ST-9.2m GSO FSS gateway earth station must not cause interference to or claim protection from NGSO FSS operations.

The Commission has granted O3b Limited ("O3b"), a Ka-band NGSO system, U.S. market access and authorized operation of a gateway earth station in Hawaii. As demonstrated in the attached Technical Appendix, operation of the ST-9.2m gateway is fully compatible with and will not cause interference to O3b's operations. Specifically, the compatibility analysis demonstrates that  $\Delta$ T/T values are below 6% for all uplink and downlink emissions. Thus, operation of the ST-9.2m gateway will not cause harmful interference to the O3b system, consistent with the obligations of secondary and nonconforming operations.

#### d. 29.1-29.15 GHz Band

The 29.1-29.15 GHz band is shared on a co-primary basis between terrestrial services and NGSO MSS feeder links. GSO FSS operations in this band are not contemplated by the Commission's rules and therefore a waiver is necessary to enable ST-9.2m gateway uplink operations in the band (see Section D below).

Similar to compatibility with NGSO operations in the 28.6-29.1 GHz and 18.8-19.2 GHz bands where ST-9.2m operations must not cause harmful interference to or claim protection from O3b operations, HPT's operations in the 29.1-29.15 GHz band also must not cause harmful interference to or claim protection from feeder links of the Iridium system. HPT understands that Eutelsat will pursue coordination with Iridium regarding proposed use of the 29.1-29.15 GHz band.

HPT acknowledges and accepts that any grant of operating authority in this band will be on a strictly unprotected, non-interference basis only as a non-conforming use. In addition, HPT certifies that it will comply with any coordination agreement between Eutelsat and Iridium. HPT reserves the right to supplement the record of this application proceeding regarding the status of such coordination and its proposed use of the 29.1-29.15 GHz band.

## C. The Eutelsat 172B Satellite

The E172B satellite will operate at the 172° E.L. orbit location and for the proposed Ka-band gateway operations is licensed by France, a member of the World Trade Organization ("WTO") for services covered under the WTO Basic Telecommunications Agreement. Thus, HPT is not required to make the effective competitive opportunities showing set out in Section 25.137 of the Commission's Rules, 47 C.F.R. § 25.137.<sup>9</sup>

Pursuant to Section 25.137(d) of the Commission's Rules, 47 C.F.R. § 25.137(d), HPT demonstrates in this application that the E172B satellite complies with applicable Commission requirements for a non-U.S. licensed satellite to operate in the United States in the subject Ka-band frequencies or requests appropriate waivers of such requirements.

HPT acknowledges that the E172B satellite has not previously been authorized by the Commission to serve the United States and this application is therefore considered a request for U.S. market access for the E172B satellite. Accordingly, HPT provides the attached Technical Appendix and Schedule S providing information relating to the E172B

<sup>&</sup>lt;sup>9</sup> See 47 C.F.R. § 25.137(a)(2); see also Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Satellites Providing Domestic and International Service in the United States, Report and Order, IB Docket No. 96-111, 12 FCC Rcd 24094, ¶ 39 (1997).

satellite generally, and the technical and operational characteristics of the Ka-band gateway payload in particular. HPT notes that Eutelsat will submit a full technical description of the E172B satellite in the context of an impending request for U.S. market access, which HPT seeks to incorporate by reference.<sup>10</sup>

# **D. WAIVER REQUESTS**

A waiver of the Commission's rules is warranted when "good cause" is shown.<sup>11</sup> In addition, a waiver may be granted if the grant "would not undermine the policy objective of the rule in question and would otherwise serve the public interest."<sup>12</sup> As discussed below, there is good cause to grant certain waivers in connection with HPT's Ka-band gateway earth station application.

#### 1. 47 C.F.R. § 2.106

HPT is seeking a waiver of the U.S. Table of Frequency Allocations, 47 C.F.R. § 2.106, and the Commission's Ka-band plan to the extent necessary to permit non-conforming operation of the ST-9.2m gateway in the 18.8-19.2 GHz and 29.1-29.15 GHz bands. In considering requests for non-conforming uses, the Commission has indicated it would grant such waivers when there is little potential for interference into any service

<sup>&</sup>lt;sup>10</sup> Because Eutelsat has not yet filed a request for authority to serve the U.S. market, HPT also respectfully requests leave to supplement this application as appropriate to include additional information relating to E172B in the docket of this proceeding.

<sup>&</sup>lt;sup>11</sup> 47 C.F.R. § 1.3; see also WAIT Radio v. FCC, 418 F.2d 1153, 1157 (D.C. Cir. 1969).

<sup>&</sup>lt;sup>12</sup> See EchoStar KuX Corp. Application for Authority to Construct, Launch and Operate a Geostationary Satellite Using the Extended Ku-band Frequencies in the Fixed-Satellite Service at the 83° W.L. Orbital Location, Order and Authorization, 20 FCC Rcd 919, ¶ 12 (2004) (Commission waiver for "good cause shown").

authorized under the Table of Allocations and when the non-conforming operator accepts any interference from authorized services.<sup>13</sup>

As discussed above, although GSO FSS operations are not contemplated in the 18.8-19.2 GHz and 29.1-29.15 GHz band, the ST-9.2m gateway can operate in these bands on an unprotected, non-interference basis. The attached Technical Appendix establishes compatibility of E172B satellite downlink operations in the 18.8-19.2 GHz band with the O3b system. In addition, Eutelsat's preliminary assessment establishes that ST-9.2m gateway operations in the 29.1-29.15 GHz band are compatible with Iridium feeder link operations and HPT expects that it will be able to access this band pursuant to coordination with Iridium. Nonetheless, in the event that it is demonstrated that HPT operations are causing harmful interference to other lawfully operating services, it will immediately suspend operations until such interference is resolved. Accordingly, appropriately conditioned grant of the requested waiver will not undermine other uses of the bands.

#### 2. 47 C.F.R. § 25.132

HPT requests a partial waiver of the data submission requirements of revised Section 25.132 of the Commission's rules to allow for post-grant submission of certain measured data for the proposed antenna type, to the extent necessary. In lieu of performance verification information antenna performance information for the 9.2m antenna is included as an attachment to the modification application. Should additional

<sup>13</sup> See Letter from Jose Albuquerque, Chief, Satellite Division and Mark Settle, Chief, Policy and Rules Division, to Suzanne Malloy, O3b Limited, DA 14-1369 (rel. September 22, 2014); Contactmeo Communications, LLC, Order and Authorization, 21 FCC Rcd 4035, 4044 (IB 2006); ViaSat AMSS Order, File No. SES-MFS-20090624-00789; see also 47 C.F.R. § 1.3. performance information be required, HPT requests a waiver to permit post-grant submission of such information because performance verification can only be conducted after antenna construction. There is good cause to waive this rule and doing so is consistent with Commission precedent.<sup>14</sup>

The proposed antenna is not a mass-production, small terminal but rather a large gateway antenna, the performance of which may vary, but because of its size generally has performance characteristics far better than the minimum standards required by the Commission's rules. Consistent with Commission precedent, HPT proposes to provide the data contemplated in Section 25.132 for the antenna within 60 days after filing the certification of completion of construction of the antenna proposed in this application.

Grant of this request will serve the public interest by allowing HPT's gateway earth station to support the provision of additional advanced satellite broadband communication services in the United States and through the Pacific Ocean region without undermining the purpose of the Commission's rules.

### 3. 47 C.F.R. § 25.210(j)

Section 25.210(j) of the Commission's rules requires satellite operators to maintain stationkeeping within 0.05° of their assigned orbital longitude in the east/west direction, unless specifically authorized by the Commission to operate with a different longitudinal tolerance. HPT understands that the E172B satellite will operate with a stationkeeping

<sup>&</sup>lt;sup>14</sup> The Commission previously granted similar waiver requests. *See, e.g.,* HNS License Sub, LLC, File No. SES-LIC-20150604-00332, Call Sign E150076 (granted Dec. 7, 2015) (adopting Condition 253 permitting submission of Section 25.138(d) antenna performance verification measurements after license grant).

tolerance of  $\pm$ .10 degree. Thus, a waiver of Section 25.210(j) may be necessary to the extent the Commission has not specifically authorized a different tolerance.

The Commission has previously waived this rule based on a finding that allowing an increased stationkeeping volume would not adversely affect the operations of other spacecraft and would have benefits such as conserving fuel for future operations.<sup>15</sup> Allowing E172B to be operated within an increased stationkeeping volume will not harm other operators. The satellite's stationkeeping volume will not overlap with that of any other satellites except E172A, which is controlled by Eutelsat and can be physically coordinated with E172B. Furthermore, the larger and previously accepted stationkeeping tolerance will afford E172B additional operational flexibility in the use of electric propulsion for on-station positioning. Finally, the proposed gateway operations with a larger spacecraft stationkeeping volume will not materially affect the interference environment. Under these circumstances, grant of any necessary waiver of Section 25.210(j) will serve the public interest.

HPT notes that the Commission has repeatedly granted authority to operate with a  $\pm .10$  degree longitudinal tolerance, subject to the condition that the waiver and the operations it permits shall terminate in the event that a satellite is launched into a location such that its stationkeeping volume would overlap a satellite's  $\pm 0.10$  degree stationkeeping volume, but would not overlap a  $\pm 0.05^{\circ}$  degree stationkeeping volume, unless the satellite operator has successfully coordinated its physical operations with those of the other

<sup>&</sup>lt;sup>15</sup> *See, e.g.*, SES Americom, Inc. Application for Modification of Satcom SN-4 Fixed Satellite Space Station License, 20 FCC Rcd 11542, 11545 (Sat. Div. 2005).

spacecraft.<sup>16</sup> HPT understands that Eutelsat acknowledges and accepts this potential condition on E172B operations.

# 4. 47 C.F.R. § 25.210(f)

Section 25.210(f) of the Commission's rules requires FSS space stations operating in any portion of the 18.3-20.2 GHz or 27.5-30.0 GHz bands to 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. HPT understands that the E172B satellite employs dual-orthogonal polarization for Ka-band gateway uplinks but only a single polarization for gateway downlinks. Although HPT understands that Eutelsat will shortly submit a full request for authority to serve the U.S. market, including appropriate waiver requests, out of an abundance of caution HPT independently requests a waiver here to permit receive operations of the ST-9.2m gateway.

The full-frequency reuse requirement was designed to ensure that satellites maximize the use of their transponder capacity to the benefit of the public.<sup>17</sup> However, in the context of both U.S. and foreign satellites, the Commission has waived this requirement where doing so would allow satellite capacity that would otherwise lay dormant to be used to provide service.<sup>18</sup>

<sup>&</sup>lt;sup>16</sup> See FCC ISAT List, available at <u>https://www.fcc.gov/isat-list</u> (noting multiple waivers for Inmarsat 3F and 4F satellites).

<sup>&</sup>lt;sup>17</sup> See Binariang Satellite Systems SDN BHD Petition for Declaratory Ruling To Add MEASAT-2 to the Permitted Space Station List, Order, DA 03-2688, 18 FCC Rcd 16623 (Int. Bur. 2003) at ¶14.

<sup>&</sup>lt;sup>18</sup> *Id*.

In this case, as in prior precedent, the subject satellite will operate from the proposed orbit location in the Ka-band subject to its foreign authorization regardless of whether it is permitted to provide service in the United States, particularly since its principal coverage area is outside U.S. territory.<sup>19</sup> Moreover, given the gateway-only operations and limited geographic scope of the Hawaii beam (leaving the vast majority of U.S. territory available for co-frequency Ka-band operations even from closely spaced locations), a waiver in this circumstance would not undermine the purpose of the rule.

## **E.** Public Interest

Grant of this application will serve the public interest by allowing HPT to deploy a Ka-band gateway earth station that will greatly enhance the services offered from the 172° E.L. orbit location by E172B. The E172B satellite will enhance competition by adding satellite capacity at the 172° E.L. orbital location, thereby expanding the options available in the United States and internationally for high-speed broadband services, including broadband Internet, video transmissions, and maritime and aeronautical communications. Operation of the proposed gateway will also enable HPT to expand its U.S. gateway earth station operations resulting in increased U.S. economic development and leadership in the satellite services marketplace.

For all of these reasons, grant of Ka-band earth station operating authority (including the waivers associated with the E172B satellite and the ST-9.2m gateway itself) will strongly serve the public interest.

<sup>19</sup> *Id*.

# II. CONCLUSION

In view of the foregoing, HPT respectfully requests that the Commission grant, at the earliest practicable time, this modification application to operate the ST-9.2m gateway earth station at the Kapolei, Hawaii, teleport facility in Ka-band frequencies from 18.4-19.2 GHz (space-to-Earth) and 27.5-29.15 GHz (Earth-to-space) with the E172B satellite.