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October 3, 2017

VIA ELECTRONIC FILING

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Iridium Applications to Modify Its Existing Blanket Earth Station Licenses, IBFS File Nos. SES-MOD-20170413-00388 and SES-AMD-20170726-00812; SES-MOD-20170413-00389 and SES-AMD-20170726-00813

Dear Ms. Dortch:

On September 29, 2017, representatives of Ligado Networks Subsidiary LLC ("Ligado") met with Jose Albuquerque, Karl Kensinger, and Stephen Duall (by teleconference) to discuss the above-referenced applications in which Iridium seeks to modify its existing blanket earth station licenses to authorize operation of a new "one-size-fits-all" terminal type it calls "Certus" (the "Iridium Applications"). The Ligado representatives in attendance included: Valerie Green, Executive Vice President and Chief Legal Officer; Bill Davenport, Senior Vice President and Deputy General Counsel, Regulatory Affairs; Maqbool Aliani, Senior Vice President, Spectrum Standards and Technology; and Gerry Waldron of Covington & Burling LLP and the undersigned as outside counsel to Ligado.

During the meeting, Ligado explained why the Iridium Applications are not routine earth station applications. Rather, they raise significant issues, as reflected in comments submitted by nearly all of Iridium's spectrum neighbors—including the GPS community and the other satellite operators in and around the Big LEO band (*i.e.*, Globalstar, Inmarsat and Ligado). All of these neighboring spectrum stakeholders agree that the Iridium Applications present material issues that must resolved through Iridium's submission of additional information *before* the agency can act upon the applications. Ligado made the following points demonstrating the unusual nature of the Iridium Applications:

- As explained in the attached slides, which were presented at the meeting, Iridium seeks authority to operate at transmit power levels up to *80 times higher* than those permitted by its existing authority (without any explanation for this increase in power). Transmissions at these levels could pose a significant risk of interference into authorized mobile-satellite service ("MSS") facilities, including Ligado's satellite receivers. Ligado

asked the Commission to require Iridium to provide additional information to enable Ligado and others to fully understand the potential impact of Iridium's proposed operations—including but not limited to antenna patterns, use cases, and system loading data.

- Iridium proposes to use the Certus terminals to provide public safety and other critical communication services, but has not shown that those terminals are designed to operate in the presence of out-of-band emissions ("OOBE") levels that the Commission has indicated Big LEO band licensees must be able to tolerate (*e.g.*, in the *2003 ATC Order*[1]). Similarly, Iridium has not demonstrated that Certus receivers would be able to operate on a secondary basis, consistent with the secondary allocation for MSS downlinks in the 1.6 GHz portion of the Big LEO band in both the United States and International Tables of Frequency Allocations.[2]

- Iridium seeks authority to operate a single terminal type that would be used ubiquitously—*i.e.*, on land, at sea, and in the air, and to carry both safety-of-life and regular commercial traffic. Importantly, most of those use cases are secondary and unprotected in the downlink direction under the United States Table of Frequency Allocations. Iridium has also proposed to conduct AMS(R)S operations with Certus terminals, which would not be secondary. But Iridium has not adequately explained how it, other operators, or the Commission would distinguish between different types of traffic on the same terminal or ensure that Iridium does not use any AMS(R)S authority it receives to mask and effectively upgrade the status of unprotected MSS downlink traffic.

- Iridium seeks immediate authority to use its Certus terminals to support AMS(R)S operations, even though relevant international and domestic standards and certification bodies—including the International Civil Aviation Organization ("ICAO"), RTCA, and the Federal Aviation Administration ("FAA")—have yet to approve that terminal type or Iridium's request to provide AMS(R)S services using such terminals. Notably, Iridium has provided no basis for the Commission to conclude that these processes will be completed successfully or soon—and no basis for the Commission to depart from its historical practice of granting radiofrequency authorizations for AMS(R)S only after the successful completion of such processes.

As noted above, Ligado emphasized that it was not alone in expressing its concerns with respect to the Iridium Applications. The same or similar questions are reflected in comments filed by virtually all of Iridium's spectrum neighbors—including the other major Big LEO band system operators and significant spectrum users on both sides of that band. Specifically:

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1 *Flexibility for Delivery of Communications by Mobile Satellite Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Band*, Report and Order and Notice of Proposed Rulemaking, 18 FCC Rcd 1962 (2003) ("*2003 ATC Order*").

2 *See* 47 C.F.R. § 2.106.

- The GPS Innovation Alliance expresses concerns that Certus terminals would cause harmful interference into radionavigation satellite service ("RNSS") operations in the 1559-1610 MHz band;[3]

- Globalstar expresses concerns about Iridium using its applications to "upgrade" the status of its unprotected MSS downlinks in the 1.6 GHz band;[4] and

- Inmarsat expresses concerns about the significant increase in transmit power levels proposed by Iridium, Iridium's ability to tolerate the known and expected operating environment, and Iridium's possible receipt of AMS(R)S authority prior to approval by domestic and international aviation regulators.[5]

In sharp contrast, *no* party (other than Iridium) has supported grant of the Iridium Applications on the record.

Ligado noted that Iridium's response to the comments of its spectrum neighbors[6] only exacerbates—rather than assuages—these concerns. Rather than providing additional information demonstrating the compatibility of the proposed Certus terminals with adjacent operations, Iridium simply asserts, incorrectly, that it need not demonstrate an ability to tolerate the known and expected operating environment because adjacent users must meet the OOBE limits specified in Section 25.202(f) of the Commission's rules.[7] This argument begs the question of whether Iridium satisfies the specific OOBE tolerance requirement established in the *2003 ATC Order*—the existence of which Iridium does not dispute—which was designed to ensure Big LEO licensees actually can operate in a manner consistent with the neighboring operating environment.[8]

Ligado also urged that the Iridium Applications—especially the concerns about Iridium's attempt to leverage the protection of safety services into some type of spectrum use priority—be

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3 *See* Comments of the GPS Innovation Alliance, IBFS File No. SES-MOD-20170413-00318 *et al*. (Sep. 8, 2017).

4 *See* Comments of Globalstar, Inc., IBFS File No. SES-MOD-20170413-00318 *et al*. (Sep. 8, 2017).

5 *See* Comments of Inmarsat, Inc., IBFS File No. SES-MOD-20170413-00318 *et al*. (Sep. 8, 2017).

6 *See* Consolidated Response of Iridium, IBFS File No. SES-MOD-20170413-00318 *et al*. (Sep. 18, 2017).

7 *See id.* at 13; *see also* 47 C.F.R. § 25.202(f).

8 Ligado also noted that Iridium has argued, in a different licensing proceeding, that its terminals are not compatible with devices operating at *much lower* power levels than the types of mobile earth stations in use today—devices which would generate OOBE much lower than the Section 25.202(f) limit. *See generally* IB Docket Nos. 11-109 and 12-340.

evaluated in light of positions that Iridium has taken in parallel efforts, namely the WRC-19 preparation process. Ligado noted that in the WRC-19 preparatory discussions by Informal Working Group-1 (Maritime, Aeronautical and Radar Services), Iridium has advocated for changes to the International Table of Frequency Allocations to afford greater protection to its secondary MSS downlink operations by leveraging the possibility of 1.6 GHz band downlinks being used to support safety services—a position that prompted strenuous objections from a United States Special Government Employee as well as users of adjacent spectrum, including GPS users.

Lastly, Ligado emphasized that if the Commission nevertheless decides to grant Iridium's pending applications at this time, such grant should at least be subject to conditions designed to prevent a new round of interference disputes between Iridium and its spectrum neighbors. Without such protections, Certus operations could generate a constant stream of interference complaints that would inevitably require the use of scarce Commission resources for investigation and resolution.[9] Accordingly, Ligado has recommended that any approval of the Iridium Applications include conditions:

(i) Requiring Iridium's downlink operations to be compatible with Ligado's L band operations;

(ii) Requiring Iridium to complete coordination with adjacent band operators—consistent with Iridium's previous acknowledgment that coordination can and should be used to resolve similar interference and protection issues;[10] and

(iii) Confirming that any grant of AMS(R)S authority does not alter Iridium's current regulatory status with respect to other spectrum users.

Regarding the last condition, during the meeting it was discussed that any AMS(R)S authority granted to Iridium for Certus terminals would be limited to oceanic, polar and remote regions outside the United States, consistent with Iridium's existing AMS(R)S authority,[11] and would *not* be expanded, for example, to include operations at an airport gate or otherwise within the vicinity of domestic airports.

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9 Such investigations could be further complicated by the difficulties inherent in any effort to determine the nature of traffic carried by Iridium's Certus terminals, as discussed above.

10 *See Iridium Constellation LLC*, Memorandum Opinion and Order, 28 FCC Rcd 964, at ¶ 5 (2013) (noting Iridium's representation that AMS(R)S-related "interference and protection issues could be resolved through coordination").

11 *See, e.g., id.* at ¶ 10.

Respectfully submitted,

/s/ John P. Janka
John P. Janka
Jarrett S. Taubman

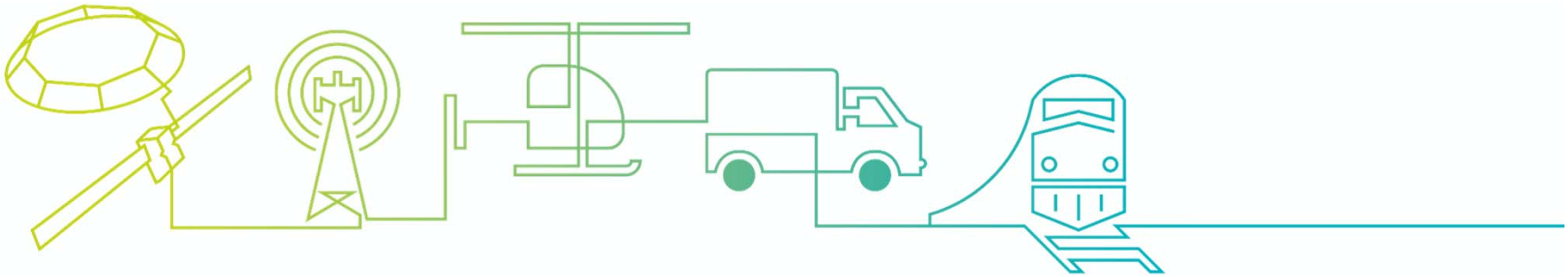
Counsel to Ligado Networks Subsidiary LLC

Enclosure

cc: Jose Albuquerque
Karl Kensinger
Stephen Duall

Ligado's Preliminary Technical Analysis of Impact of High Power Levels of Certus Terminals on Operational L-Band Satellites

SEPTEMBER 29, 2017



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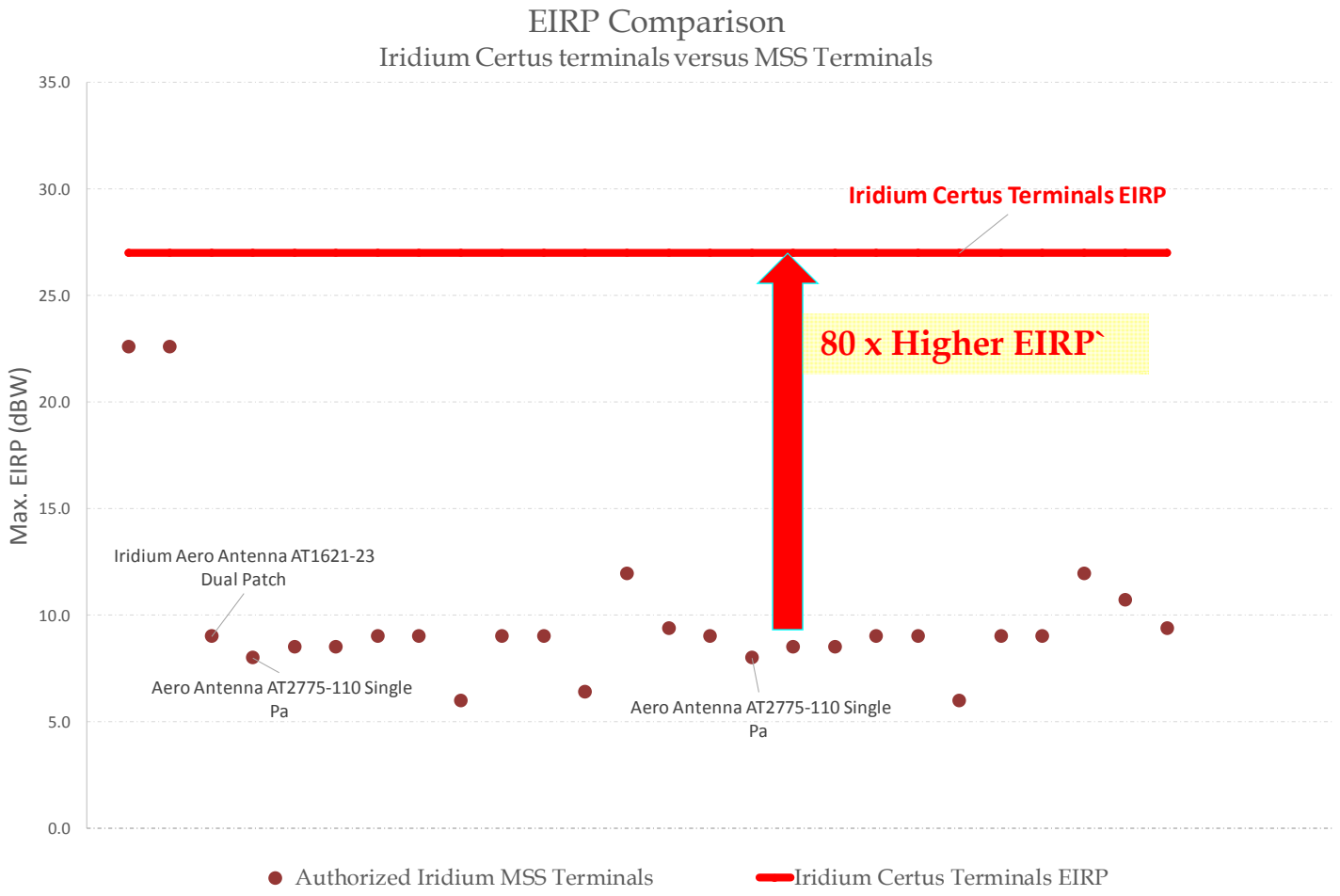
EIRP Comparison of Certus versus Legacy Iridium Terminals

Iridium's Certus terminals transmit at far higher power than existing authorized Iridium MSS terminals



Ligado's Observation of the Impact of Certus Terminals to its MSS Network

- The combination of thousands of simultaneous active Iridium Certus terminals, each transmitting at +27.7 dBW, would produce an aggregate power at each Ligado satellite feed element orders of magnitude larger than currently exists. Our satellite filter discrimination toward the Big Leo band will be negligible due to its close proximity to Ligado's uplink L-band
- Due to high return payload gain on our SkyTerra-1 satellite, the entire return payload chain would need to be analyzed before we could feel comfortable with such high uplink levels in the adjacent band
  - Additional information from Iridium is required such as antenna patterns, use cases and system loading, etc.