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October 22, 2019

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: Notice of *Ex Parte* Presentation, IB Docket No. 11-109; IBFS File Nos. SES-MOD-20151231-00981, SAT-MOD-20151231-00090, and SAT-MOD-20151231-00091, SAT-AMD-20180531-00045, SAT-AMD-20180531-00044, SES-AMD-20180531-00856

Dear Ms. Dortch:

This letter responds to Iridium Communications Inc.'s ("Iridium") latest recitation of its unfounded complaints[1] against Ligado's License Modification Applications ("License Modification Applications"), issues that Iridium raised more than three years ago, that Ligado has answered on several occasions, and that Iridium simply repeats and repeats again presumably to continue to delay agency action.[2] Because the issues raised in the September 30 Iridium Letter have been addressed on multiple occasions, Ligado submits this brief *ex parte* letter to remind the Commission that these issues have been fully briefed and that there is no reason for further delay on the pending License Modification Applications.

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[1] *See* Letter from Bryan N. Tramont, Counsel, Iridium Communications Inc., to Marlene H. Dortch, Secretary, FCC, IBFS File Nos. SAT-AMD-20180531-00045, SAT-AMD-20180531-00044, SES-AMD-20180531-00856; SES-MOD-20151231-00981, SAT-MOD-20151231-00090, and SAT-MOD-20151231-00091; IB Docket Nos. 12-340, 11-109 (Sept. 30 2019) ("September 30 Iridium Letter").

[2] *See, e.g.*, Letters from Bryan N. Tramont, Counsel, Iridium Communications Inc., to Marlene H. Dortch, Secretary, FCC, IBFS File Nos. SAT-AMD-20180531-00045, SAT-AMD-20180531-00044, SES-AMD-20180531-00856; SES-MOD-20151231-00981, SAT-MOD-20151231-00090, and SAT-MOD-20151231-00091; IB Docket Nos. 12-340, 11-109 (Dec. 14, 2016 *and* Sept. 26, 2016); Letters from Gerard J. Waldron, Counsel, Ligado Networks, to Marlene H. Dortch, Secretary, FCC, IB Docket Nos. 11-109 and 12-340; IBFS File Nos. SES-MOD-20151231-00981, SAT-MOD-20151231-00090, and SAT-MOD-20151231-00091 (Jan. 16, 2017 *and* Nov. 2, 2016) ("Ligado *Ex Partes*") (engineering analysis showing that Ligado's proposed terrestrial operations will not cause harmful interference to Iridium's operations).

1. Ligado has satisfied requirements related to Section 25.253 of the Commission's rules.

Iridium frames this most recent filing around purported out-of-band ("OOBE") emissions interference concerns and claims that Ligado has not met the requirements for grant of a waiver of the Section 25.253 OOBE limits. These claims are both incorrect and misleading.

As a threshold matter, it is important to make clear that the relevant Commission guidance regarding the level of emissions protections to which Iridium as an operator in the Big LEO band is entitled is the Commission's 2003 Ancillary Terrestrial Component ("ATC") Order. The 2003 ATC Order expressly identifies the OOBE limits that Big LEO Operators—such as Iridium—must be capable of tolerating. Specifically, the 2003 ATC Order states that "*Big LEO systems must be capable of tolerating MET emissions in the 1610-1626.5 MHz band that range from -47 dBW/4KHz to -58 dBW/4kHz.*"[3] The Order further explains that maintaining OOBE within limits consistent with that standard would avoid the possibility of causing cognizable interference to Iridium. The Commission expressly found that operations consistent with that limit would not increase "the likelihood of objectionable interference."[4]

The operations proposed in Ligado's License Modification Applications easily meet these limits. In its pending License Modification Applications, Ligado simply reiterates that it can meet an OOBE level of -49.2 dBW/30 kHz (-58 dBW/4 kHz) at 1626.5 MHz. This level is well within the range that the Commission's 2003 ATC Order sets forth as acceptable—and is actually at the *far low end* of that range. Thus, as demonstrated in **Illustration 1** below, the limit in Ligado's License Modification Applications *already fully meets* the tolerable emissions limits defined in the 2003 ATC Order—an Order that the Commission issued *specifically to establish tolerable emission levels in the Big LEO band*, and to provide operators notice of those parameters by clearly setting expectations. Iridium's claims amount to little more than an attempt to relitigate the 2003 ATC Order, which put Iridium on notice 16 years ago that it would be required to tolerate much less restrictive OOBE limits than those in Ligado's License Modification Applications.

[3] *See 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*, 18 FCC Rcd. 1962, at ¶ 178 (2003) ("2003 ATC Order") (emphasis added).
[4] See *SkyTerra Subsidiary LLC*, Order and Authorization, 25 FCC Rcd. 3043, at ¶ 42 (2010) ("2010 ATC Modification Order Order").

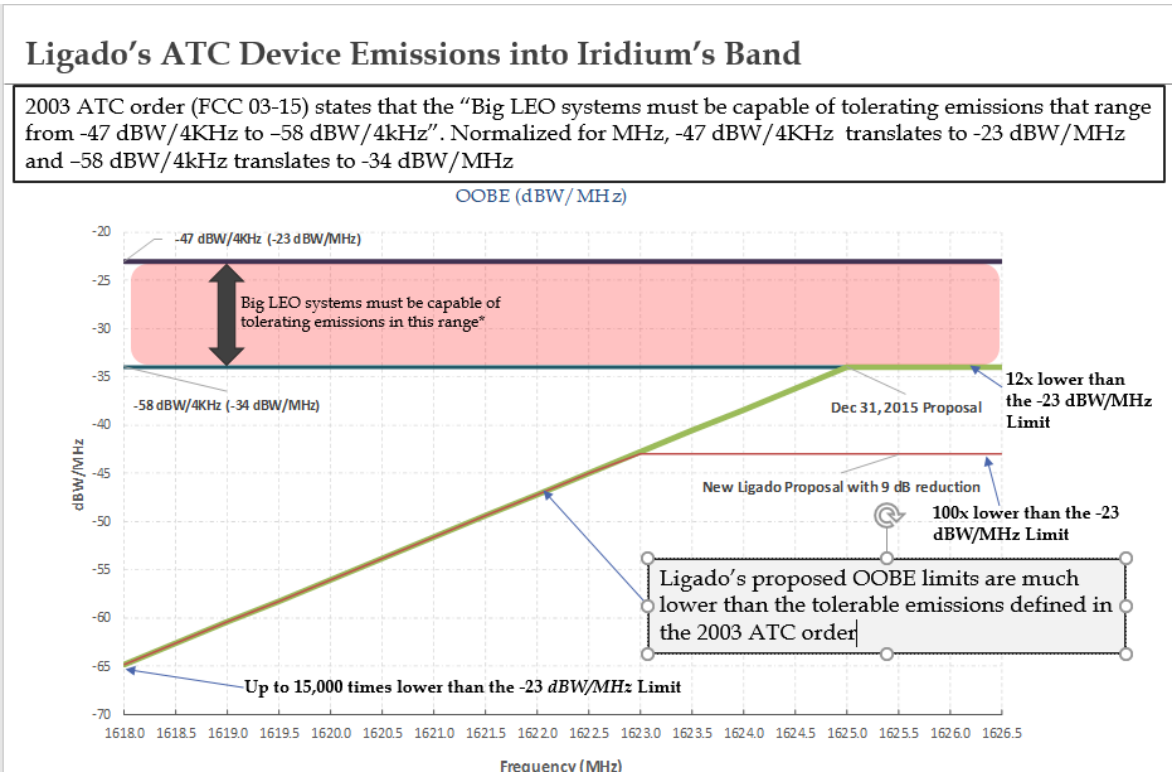

Illustration 1

That -58 dBW/4 kHz at 1626.5 MHz is the relevant OOBE limit with respect to Iridium's claims is underscored by the fact that the Commission articulated -58 dBW/4 kHz at 1626.5 MHz as the limit to which Ligado must adhere again in the 2010 ATC Modification Order. Specifically, the Commission explained that there was "good cause" to permit Ligado's ATC mobile terminals to operate within a limit of -58 dBW/4kHz on out-of-channel emissions at a 1 MHz offset beyond the edges of assigned spectrum bands.[5] Thus the Commission reiterated the relevance of the limit that it had first identified 7 years earlier in the 2003 ATC Order. This is the limit Ligado has committed to meeting in its pending License Modification Applications. And analysis from the Department of Defense and its outside consultant Alion Science and Technology Corporation confirms that Iridium's devices will not experience harmful interference from Ligado's transmissions in the 1627.5-1637.5 MHz band based on the power limits proposed in the License Modification Applications, as Ligado has previously explained.[6]

[5] *Id.*

[6] Reply Comments of Ligado Networks LLC, IB Docket No. 11-109, IBFS File Nos. SAT-AMD-20180531-00044, SAT-AMD-20180531-00045, at 21 (July 19, 2018) ("July 2018 Reply Comments"). Even though Iridium's largest customer has indicated that Iridium's devices will

Not only does Iridium fail to acknowledge both the 2003 ATC Order and the 2010 ATC Modification Order, but it also fails to acknowledge that the Section 25.253 provisions it relies on to frame its entire argument were *not designed to protect operators like Iridium*. As evident by the fact that Section 25.253(g)(1) regulates out of *channel* emissions, it was designed to protect operators *within the L-Band*, not operators in other bands such as the Big LEO band in which Iridium is located. Thus any interference protection benefit Iridium happens to derive from Section 25.253 is incidental, and Iridium cannot use Section 25.253 to insist that Ligado meet a stricter OOBE limit to protect Iridium's operations.

Notwithstanding all of these legal and technical realities which make clear that Iridium will not experience any harmful interference from Ligado's operations, Ligado nevertheless made a good faith offer to reduce its OOBE level *by an additional 9 dB* at 1626.5 MHz. This further reduction would create an overall OOBE level of -67 dBW/4kHz at 1626.5 MHz—which would in fact satisfy Section 25.253's requirements. Iridium has simply ignored this fact. This 9 dB further reduction offer, which Ligado made three years ago and has reiterated several times since, reflects a substantial concession. Moreover, it not only provides Iridium more protection than it is entitled to expect based on the 2003 ATC Order and 2010 ATC Modification Order, but it also means that, in any event, Ligado can meet the limits of Section 25.253(g)(1) at 1626.5 MHz as Iridium insists Ligado should do.[7] Iridium's choice to ignore this concession, and implicitly misrepresent Ligado's proposed OOBE, should not give Iridium the right to claim that Ligado's License Modification Applications should not be granted because of Section 25.253(g)(1).

2. *Ligado's overarching goal has been consistent since the Commission authorized ATC sixteen years ago: to use both satellite services and a terrestrial component to offer secure, reliable, and ubiquitous connectivity to its customers.*

To the extent Iridium claims that the Commission should scrutinize Ligado's License Modification Applications because Ligado's business plans have evolved since 2003, Ligado would note that, since the Commission first authorized ATC in 2003, the company and its

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not experience harmful interference from Ligado's proposed operators, Iridium still suggests that its devices can coexist with Ligado's only if Ligado emissions do not exceed -124.1 dBW/30 kHz. *See* September 30 Iridium Letter, *supra* note 1, at 15. That limit would effectively create a 20 MHz guard band for Iridium and render the spectrum between 1626.5 MHz and 1645.5 MHz commercially worthless for terrestrial purposes, notwithstanding the fact that the Commission adopted the 2003 ATC Order to maximize commercial use of that same spectrum.

[7] In addition, Ligado's offer to further reduce its OOBE to -67 dBW/4 kHz at 1626.5 MHz offers Iridium 1 dB more of interference protection as compared to the emission limits the Commission has adopted for ATC operations in Iridium's own MSS frequency band under Section 25.254(b)(3) of the Commission's rules.

predecessors have pursued the same fundamental twin goals of using satellite capability to offer customers full national coverage and to build out a terrestrial network to enhance that capability with greater capacity. Ligado made that clear in its 2015 License Modification Applications and has reiterated that point many times since.[8] It is understandable that Iridium, with its limited spectrum availability and reliance on satellite customers only, is concerned that in a rapidly changing communications ecosystem it may find itself in a disadvantageous competitive position. Iridium has been well aware of this possibility since the Commission authorized ATC sixteen years ago, and its latest efforts are evidence of a desire to use the regulatory process for competitive advantage by asserting claims that even its largest customer, the Department of Defense, has found to lack merit[9] and that Ligado has shown to be baseless.[10]

Iridium noted that its business has evolved, and it is now focused on the machine-to-machine ("M2M") market. The challenge for Iridium is that Ligado will be better equipped to serve the M2M market since it will not only have the ubiquitous coverage offered by satellite but also will combine that with a terrestrial capability. The company's advantages over Iridium begin with Ligado's SkyTerra 1, one of the most powerful L-band commercial satellites ever built. Ligado's SkyTerra 1's 22-meter satellite reflector is the largest on any commercial satellite, allowing for the use of small devices that are cost-effective. SkyTerra 1's Aggregate Equivalent Isotropically Radiated Power ("AEIRP") is the highest among all commercial MSS systems. That RF power level, coupled with SkyTerra 1's Ground-Based Beam Forming ("GBBF") technology, provides Ligado's satellite with far greater flexibility to manage power and bandwidth on a geographic basis. In addition, Ligado's plan to use standards-based IoT protocols for satellite use will enable the company's solutions to benefit from the scale of the much larger terrestrial mobile ecosystem, which means the Iridium solutions will be disadvantaged due to their reliance on proprietary satellite technology and the higher-cost satellite-only ecosystem. Most importantly, with authority to operate a terrestrial network,

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[8] *See, e.g.*, Request for Prompt Commission Action Under Section 7, IB Docket No. 11-109; IBFS File Nos. SES-MOD-20151231-00981; SAT-MOD-20151231-00090; SAT-MOD-20151231-00091, SAT-AMD-20180531-00044, SAT-AMD-20180531-00045, SES-AMD-20180531-00856 (June 25, 2019); Letter from Gerard J. Waldron, Counsel to Ligado Networks LLC, to Marlene H. Dortch, FCC Secretary, IB Docket No. 11-109; IBFS File Nos. SES-MOD-20151231-00981; SAT-MOD-20151231-00090; SAT-MOD-20151231-00091 (Aug. 14, 2018), at 1; Letter from Gerard J. Waldron, Counsel to Ligado Networks LLC, to Marlene H. Dortch, FCC Secretary, IB Docket No. 11-109; IBFS File Nos. SES-MOD-20151231-00981; SAT-MOD-20151231-00090; SAT-MOD-20151231-00091 (June 5, 2017), at 1; Letter from Angela E. Giancarlo, Ligado Networks, to Marlene H. Dortch, Secretary, FCC, IB Docket Nos. 11-109; IBFS File Nos. SES-MOD-20151231-00981, SAT-MOD-20151231-00090, and SAT-MOD-20151231-00091 (Apr. 6, 2017), at 1.

[9] *See* July 2018 Reply Comments at 20–21 (July 19, 2018).

[10] *See id.*; Ligado *Ex Partes*, *supra* note 2.

Ligado will be able to configure unique solutions for key industry verticals. These advantages all make Ligado's MSS network ideal for next-generation internet-of-things (IoT) operations. For example, in the rail industry, which has operations that span throughout the United States, Ligado can deliver assured service continuity through a combination of terrestrial network service in areas of concentrated rail operations and ubiquitous satellite network service that would operate using cost-efficient, standards-based technology.[11] Iridium is therefore highly motivated to cloud the record, but despite its repetitious efforts, the evidence is clear that Ligado will not cause harmful interference to Iridium.[12]

Iridium also claims that Ligado "proposes to deploy terrestrial operations using omnidirectional antennas with vastly different uses and devices than MSV contemplated, and envisions the potential for tens of millions of such devices."[13] This claim about vastly different antennas and devices is misguided on both historical and technical grounds. *First*, use of omnidirectional antennas for terrestrial services in this spectrum was contemplated when ATC was first being discussed and planned by Ligado's predecessor MSV. In addition, a review of the Commission's 2003 ATC Order,[14] 2005 Order[15] and 2010 ATC Modification Order [16] shows the Commission's Orders do not make any assumption or impose any limitations anywhere about the directionality of the device antenna. *Second*, Iridium's implication that Ligado is wrong to consider different uses for and/or devices with omnidirectional antennas than those MSV considered many years ago is fatuous. No one should be surprised that uses and devices for communications operations—including, Iridium admits, its own—are different in 2019 than they were in 2003. Business plans for communications technologies change regularly as technology evolves; it would be odd for Ligado to consider adhering to the same exact business plan as was contemplated sixteen years ago, and odder still that Iridium suggests Ligado should. *Finally*, the claim that tens of millions of devices would be operating immediately proximate to Iridium's band reflects a profound misunderstanding of how LTE operates (a misunderstanding which Iridium has suffered from in the past, perhaps because it helps their flawed analysis[17]). Even

[11] Letter from Gerard J. Waldron, Counsel, Ligado Networks, to Marlene H. Dortch, Secretary, FCC, IB Docket Nos. 11-109 and 12-340; IBFS File Nos. SES-MOD-20151231-00981, SAT-MOD-20151231-00090, and SAT-MOD-20151231-00091 (Aug. 6, 2019).
[12] *See, e.g.*, July 2018 Reply Comments at 20-21; Ligado *Ex Partes*, *supra* note 2.
[13] Sept. 30 Iridium Letter at 4.
[14] *See* 2003 ATC Order.
[15] *See Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L Band, and the 1.6/2.4 GHz Bands*, Memorandum Opinion and Order and Second Order on Reconsideration, 20 FCC Rcd. 4616 (2005).
[16] *See* 2010 ATC Modification Order.
[17] *See, e .g.*, Letter from Bryan N. Tramont, Counsel, Iridium Communications Inc., to Marlene H. Dortch, Secretary, FCC, IBFS File Nos. SAT-AMD-20180531-00045, SAT-AMD-20180531-00044, SES-AMD-20180531-00856; SES-MOD-20151231-00981, SAT-MOD-20151231-00090, and SAT-MOD-20151231-00091; IB Docket Nos. 12-340, 11-109 (Dec. 14, 2016).

assuming that Ligado had tens of millions of devices in service, the *time and frequency resource multiplexing* nature of LTE as well as usage activity dictates that only a small percentage of those devices could be operated close to the Iridium band at any one time.

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Iridium's latest filing thus amounts to yet another attempt to distort legal and factual reality and provides no basis to delay a decision on the pending License Modification Applications.

Please direct any questions to the undersigned.

Sincerely,

/s/ *Gerard J. Waldron*
Gerard J. Waldron
Ani Gevorkian
Counsel to Ligado Networks LLC