

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

In the Matter of)	
)	
Iridium Constellation LLC Petition for)	RM-11697
Rulemaking to Promote Expanded Mobile)	
Satellite Service in the Big LEO MSS-band,)	
)	
Terrestrial use of the 2473-2495 MHz Band for)	IB Docket No. 13-213
Low-Power Mobile Broadband Networks;)	RM-11685
Amendments to Rules for the Ancillary)	
Terrestrial Component of Mobile Satellite)	
Service Systems)	
)	

SUPPLEMENTAL COMMENTS OF IRIDIUM CONSTELLATION LLC

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EXECUTIVE SUMMARY

The record in the above captioned proceedings provides a compelling case for increasing the amount of spectrum available to meet current and future demand for Iridium's innovative mobile satellite communications services. Indeed, following the filing of comments on Iridium's Petition for Rulemaking, Iridium submitted its application for approval of a new constellation of satellites forming the Iridium NEXT system. The requested additional spectrum will enable advances in satellite service quality, capabilities and speeds to benefit customers in the United States and around the world.

In its petition, Iridium showed that access to a small amount of additional Big LEO band spectrum would ensure the continuation and growth of offerings focused solely on the need of mobile satellite users. Specifically, Iridium requested an exclusive authorization for a 0.95 megahertz block currently shared with Globalstar and an adjoining 1.775 megahertz of spectrum currently authorized to Globalstar (1616 MHz to 1618.725 MHz). Iridium's modest proposal focusing on mobile satellite users stands in sharp contrast to the contemporaneous request of Globalstar (the only other Big LEO MSS operator), which seeks to convert 11.5 megahertz of its MSS spectrum to terrestrial only uses; to eliminate any requirement to provide satellite service at all in the Big LEO band; and, to place an additional 10.5 megahertz of unlicensed spectrum under its licensed or "managed" control.

Globalstar predictably responded to Iridium's measured proposal with hyperbolic claims that any allocation of L-band spectrum – no matter how small – would be catastrophic for its satellite business (a claim that seems at odds with the fact that its proposed terrestrial service actually precludes satellite services wherever it is deployed). When rationally examined, Globalstar appears to be making two basic arguments: (1) its simplex services require spectrum

from 1610 MHz to 1617.5 MHz (Simplex Channels A-C in its channelization plan); (2) its duplex services also require an additional 1.23 megahertz of spectrum from 1616.495 MHz to 1618.725 MHz (Duplex Channel 7 under its channelization plan).

Without conceding the merits of Globalstar's claims, Iridium now submits a simple and elegant solution that allows Iridium access to much-needed additional spectrum while leaving Globalstar's services unaffected. As detailed below, Globalstar's simplex services are only offered in spectrum below 1617.5 MHz and Globalstar has not identified a need for the spectrum from 1617.5 MHz to 1618.725 MHz in providing duplex services. Accordingly, Iridium is revising its original proposal to seek exclusive authorization at this time only for 1617.5 MHz to 1618.725 MHz in order to allow for expedited approval of its request.

With respect to the spectrum from 1616 MHz to 1617.5 MHz, Iridium now revises its proposal to seek only shared and co-primary rights for its Big LEO MSS. By limiting the reallocation to shared use, Globalstar's concerns about maintaining its operations in those bands can be fully addressed through coordination, particularly in light of the reduced scope of satellite operations contemplated by Globalstar's Terrestrial Low Power Service ("TLPS") proposal.

In view of the modifications to its petition, Iridium submits that its proposals can and should be promptly approved. Indeed, the action requested by Iridium does not require any rule changes and can be done immediately based on the record before the Commission.

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SUPPLEMENTAL COMMENTS OF IRIDIUM CONSTELLATION LLC

Based on the record in the above captioned proceedings, Iridium Constellation LLC (“Iridium”), by its attorneys, hereby submits a simple and elegant approach to promote expanded mobile satellite service (“MSS”) in the Big Low Earth Orbiting MSS (“Big LEO MSS”) band by allocating currently unused spectrum for use in its satellite services and permitting expanded sharing by Big LEO MSS operators. Specifically, Iridium suggests herein a revised near-term approach for maximizing the utility of the 1.6 GHz portion (1610-1626.5 MHz) of the Big LEO MSS-band by reassigning the 1.225 megahertz of spectrum at 1617.5-1618.725 MHz for Iridium’s exclusive use, and designating the Big LEO band spectrum between 1616 MHz and 1617.5 MHz for shared use between the operators. As Iridium explains below, this modest adjustment to the 1.6 GHz Big LEO MSS band plan will enable continued, new, and improved MSS without impinging on Globalstar’s existing services. Concurrently with this filing, Iridium also submits comments in response to the Federal Communications Commission’s

(“Commission”) Notice of Proposed Rulemaking in the above-captioned proceeding¹ highlighting the importance of preserving the Big LEO MSS band as a home for robust, essential satellite services.

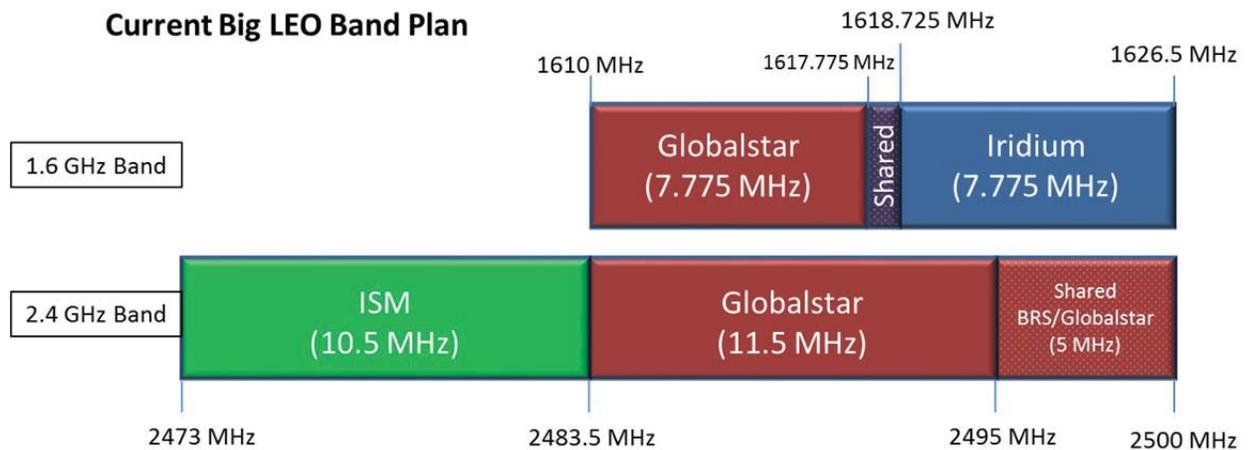
I. BACKGROUND

The Commission has long recognized the vital role critical mobile satellite services play in the United States communications infrastructure.² Mobile satellite services are relied upon by the U.S. government, public safety, emergency responders, the energy and transportation industries, the maritime and aviation sectors, and other diverse commercial and individual users because of their ubiquity and reliability, and the constant innovation in the satellite industry. Iridium – the only U.S. based and U.S. licensed company focused on providing a full range of mobile satellite services – has been a leader in the satellite sector from its start. With the pending launch of Iridium’s next generation system, Iridium NEXT, Iridium will build upon its history of working closely with customer and industry partners to develop exciting satellite solutions that provide communications capability no other technology can. In this proceeding, the Commission has an opportunity to promote the future growth and success of critical mobile satellite services through a modest adjustment to the Big LEO MSS band plan.

¹ See Terrestrial Use of the 2473-2495 MHz Band for Low-Power Mobile Broadband Networks; Amendments to Rules for the Ancillary Terrestrial Component of Mobile Satellite Service Systems, IB Docket No. 13-213, RM-11685, *Notice of Proposed Rulemaking*, 28 FCC Rcd 15351 (2013) (“TLPS Notice”).

² See, e.g., *Use of Returned Spectrum in the 2 GHz Mobile Satellite Service Frequency Bands*, Order, 20 FCC Rcd 19696, 19707, at ¶ 28 (2005) (“Returned Spectrum Order”) (outlining some of the many public benefits of continued access to mobile satellite services); *Fixed and Mobile Services in the Mobile Satellite Service Bands at 1525-1559 MHz and 1626.5-1660.5 MHz, 1610-1626.5 MHz and 2483.5-2500 MHz, and 2000-2020 MHz and 2180-2200 MHz*, Report and Order, 26 FCC Rcd 5710, 5711 ¶ 4 (2011) (“MSS Report and Order”) (noting the particular importance of MSS in emergency situations when terrestrial infrastructure is unavailable).

Since the adoption of the Big LEO MSS band in 1994, the Commission has acknowledged the need occasionally to re-examine the Big LEO spectrum plan “to refine the use of the band to better serve the public interest.”³ The Commission most recently addressed the band in 2007, when it adopted the current band plan.⁴ Today, Iridium and Globalstar are the only satellite operators licensed in the Big LEO band. Of the 33 megahertz of Big LEO band spectrum, Globalstar is licensed to conduct satellite operations over 25.225 megahertz of paired spectrum in the 1.6 GHz and 2.4 GHz portions (2483.5-2500 MHz), including the 0.95 megahertz it shares with Iridium. Iridium, on the other hand, has exclusive rights to only 7.775 megahertz of unpaired L-band spectrum.



In 2012, Globalstar sought to reopen the Big LEO MSS band plan when it requested relief from any obligation to provide a satellite service and Commission authority to convert its

³ See Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands, IB Docket No. 02-364, *Report and Order and Notice of Proposed Rulemaking*, 18 FCC Rcd 1962, 2088 ¶ 265 (2003) (citing *Big LEO Order*, 9 FCC Rcd at 5959-61, ¶¶ 54-57) (“*Big LEO Spectrum Sharing Notice*”).

⁴ See Spectrum and Service Rules for Ancillary Terrestrial Components in the 1.6/2.4 GHz Big LEO Bands, Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands, *Second Order on Reconsideration, Second Report and Order, and Notice of Proposed Rulemaking*, 22 FCC Rcd 19733 (2007) (“*Big LEO Second Reconsideration Order*”).

satellite spectrum into another terrestrial wireless band.⁵ Globalstar's proposal has two phases: In the initial phase, Globalstar would annex nearly 11 megahertz of unlicensed Industrial, Scientific, and Medical ("ISM") spectrum to its licensed 2.4 GHz satellite holdings to deploy a licensed Terrestrial Low Power Service ("TLPS"), which it acknowledges cannot coexist with satellite operations.⁶ In the second phase, Globalstar would complete the conversion of its satellite spectrum to terrestrial use by replacing TLPS with LTE operations in the paired 1.6 GHz and 2.4 GHz bands.

Partially in response to this proposal, and to ensure sufficient spectrum to support the expected continued growth in Big LEO MSS operations, in February 2013, Iridium filed a Petition for Rulemaking proposing the Commission reassign to Iridium's exclusive use 2.725 megahertz of spectrum currently assigned to Globalstar or shared use of the operators (1616-1618.725 MHz).⁷ In its Petition, Iridium emphasized its focus on anticipating, innovating, and delivering solutions for the high-bandwidth satellite needs of first responders, U.S. military, U.S. government, consumers, businesses, maritime users, machine-to-machine ("M2M") applications, and users in rural or remote areas. Iridium is benefitting from growth in demand and capabilities due to its unique ability to provide communications that cover the entire country and globe 24/7 without the need for local terrestrial facilities or local gateways. Impressively, Iridium is among

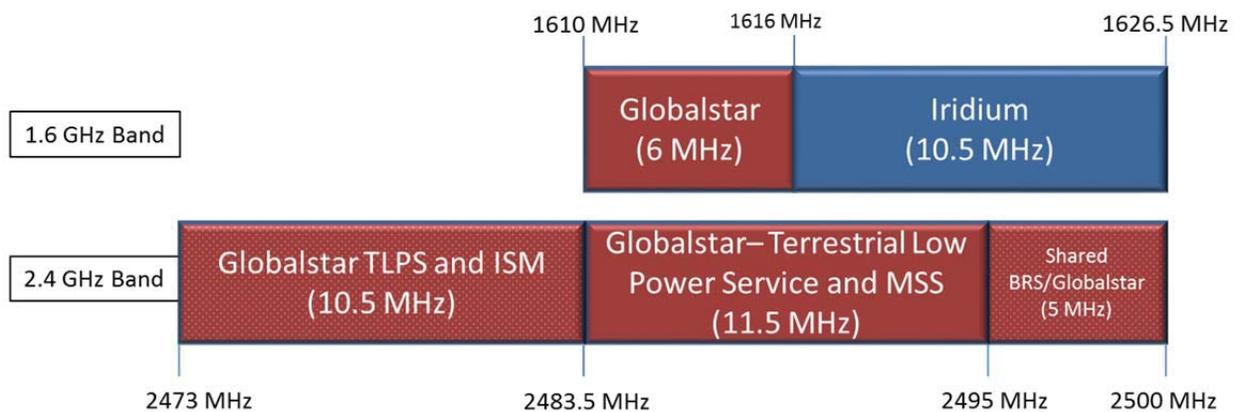
⁵ See Petition for Rulemaking of Globalstar Inc., RM-11685 (filed Nov. 13, 2012).

⁶ See *id.* at 29-30 (recognizing the need for Globalstar to manage MSS exclusion zones that will result from the deployment of TLPS); see also Kevin Pritchard, "A look inside Globalstar's plan to build an exclusive nationwide Wi-Fi network", Gigaom.com, <http://www.gigaom.com/2014/03/17/a-look-inside-globalstars-plan-to-build-an-exclusive-nationwide-wi-fi-network> (Mar. 17, 2014) (referring to an interview with Globalstar Vice President of Regulatory Affairs Barbee Ponder in which Ponder suggested interference between TLPS and MSS will be managed by limited MSS operations to areas where TLPS is deployed).

⁷ Iridium Constellation LLC, Petition for Rulemaking, RM-11697 (filed Feb. 11, 2013) ("Iridium Petition").

the most spectrally efficient modern communications systems: it operates this robust, versatile global network on less than 9 megahertz of unpaired spectrum. Iridium underscored its commitment to being a leader in satellite solutions, and explained that the modest spectrum reassignment requested would give it 10.5 megahertz of exclusive 1.6 GHz band spectrum, allowing Iridium to maximize the utility of its current and next-generation satellite systems, without interfering with Globalstar’s near-term terrestrial aspirations.

Iridium 10.5 MHz Proposal from Petition for Rulemaking



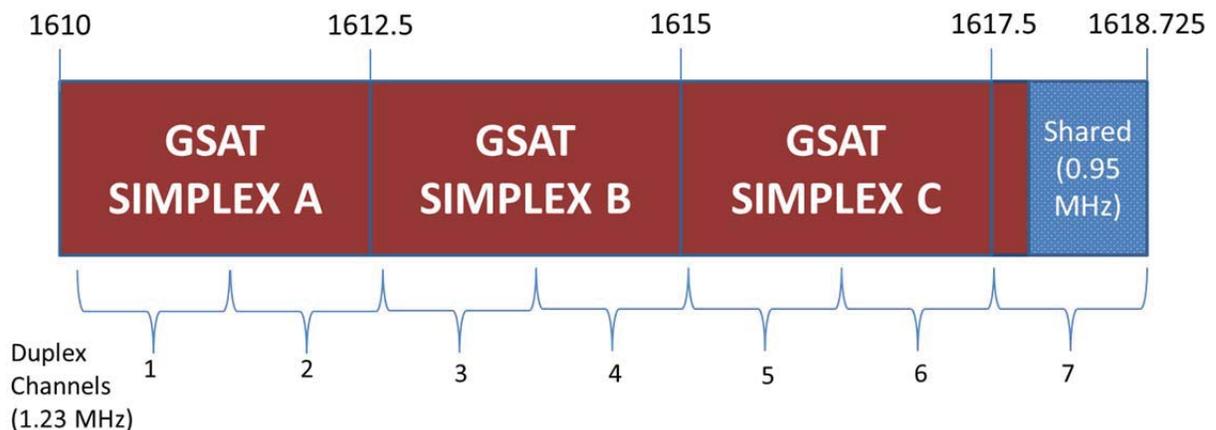
Globalstar opposed Iridium’s Petition on the grounds that the spectrum reassignment Iridium proposed would present challenges to Globalstar’s own pre-terrestrial MSS operations.⁸ With respect to its simplex services, Globalstar explained that technological constraints of its system and choices it had made in its channel configuration created a problem with the embedded base of one-way SPOT devices. According to Globalstar, were the Commission to reassign the spectrum above 1616 MHz to Iridium, under its current channelization Globalstar would only be able to conduct SPOT operations on its two 2.5 megahertz-wide simplex channels closest to the radio astronomy service (“RAS”) band – Simplex Channels A and B. Globalstar

⁸ See Opposition of Globalstar, Inc. to Petition for Rulemaking, RM-11697 (filed Dec. 2, 2013) (“Globalstar Opposition”).

asserted that this would render SPOT inoperable in the approximately 15 percent of the country where RAS protection obligations limit Globalstar’s operations at 1610.6-1613.8 MHz.

Globalstar further suggested that this would necessitate recall of all its existing SPOT products, which were designed without capability to receive firmware updates remotely.

Globalstar L-Band Channelization



With respect to its duplex services, Globalstar asserted that denying it any access to spectrum above 1616 MHz would render some devices inoperable across much of the United States. Globalstar suggested this is because these devices, which presumably lack the GPS functionality it has been installing in SPOT devices for years, cannot be located by the Globalstar network until they have made initial contact with Globalstar’s ground infrastructure. To protect RAS, Globalstar reports that these devices always make the initial “access” calls using the duplex channels 5 and above, which rely on spectrum above 1616 MHz.⁹ Reassigning this spectrum to Iridium on an exclusive basis, Globalstar suggests, could effectively prevent such duplex devices from operating throughout much of the United States.

⁹ Globalstar did not address whether it feasibly could explore an alternate duplex channelization to avoid these problems. Iridium notes that Globalstar’s duplex devices presumably do not have the same inherent technical limitations on receiving firmware upgrades as its transmit-only simplex products.

Notably, Globalstar's Opposition articulated no current use of the spectrum associated with its Duplex Channel 7 (1617.495-1618.725 MHz), which includes the 0.95 megahertz of spectrum currently shared by Iridium and Globalstar.

II. IRIDIUM'S REVISED SPECTRUM PROPOSAL

The goal of Iridium's Petition for Rulemaking is to promote satellite innovation and maximize the availability and utility of satellite services in the Big LEO band. Iridium does not intend through the Petition to interfere with any of Globalstar's legitimate satellite activities or plans. As such, Iridium offers an alternative to the proposal contained in its Petition for Rulemaking. Iridium's revised proposal derives from three observations taken from the record in this proceeding:

- *First*, Iridium has demonstrated a real and pressing need for additional spectrum to support current and growing demand for satellite services, both on the present constellation and also on Iridium NEXT, scheduled to begin launch in 2015.
- *Second*, although Globalstar identified some near-term technical challenges to a reassignment of 1616-1618.725 MHz for Iridium's exclusive use, its simplex channelization plan and its duplex uses are below 1617.5 MHz as described in its Opposition.
- *Third*, Globalstar is investing in and advocating for a technology, TLPS, that cannot coexist with duplex Globalstar MSS operations – wherever TLPS is deployed Globalstar's two-way satellite service disappears.

In light of these factors, and as a near-term approach to maximizing satellite operations in the Big LEO Band, Iridium therefore proposes that the Commission reassign only the 1617.5-1618.725 MHz portion for Iridium's exclusive use for now. This 1.225 megahertz of spectrum

includes the portion currently shared by Iridium and Globalstar, as well as the portion of Globalstar's Duplex Channel 7 that is above its Simplex Channel C.¹⁰ The resulting modest reassignment would make available an additional 1.225 megahertz of spectrum for Iridium's exclusive use, giving the company 9 megahertz of unpaired exclusive use spectrum in total.

In the days of broadband applications using ever-increasing channel sizes an additional 1.225 megahertz may seem insignificant, particularly compared to the nearly 11 megahertz of unlicensed spectrum Globalstar seeks to add to its assignment. However, for the highly efficient Iridium system, this injection of additional spectrum would reap major benefits for consumers. This would be an overall increase in Iridium's exclusive spectrum holdings of nearly 16 percent, enabling continued growth of Iridium's existing services and the deployment of exciting new MSS capabilities and offerings documented in Iridium's petition. Importantly, the reassignment would achieve these public benefits without impinging on Globalstar's MSS operations

Additionally, to satisfy the dual goals of enabling Iridium to meet expected demand growth while also ensuring Globalstar sufficient spectrum to operate, Iridium proposes the Commission designate the remainder of the spectrum above 1616 MHz (1616-1617.5 MHz) for shared use between the operators. Assumptions about the future of the Big LEO MSS band and the reality of the overall mobile satellite market have shifted significantly since the Commission last examined spectrum sharing between the systems in 2007.¹¹ Globalstar's business plans now call for nationwide authority to deploy a 2.4 GHz TLPS system that will preclude duplex satellite

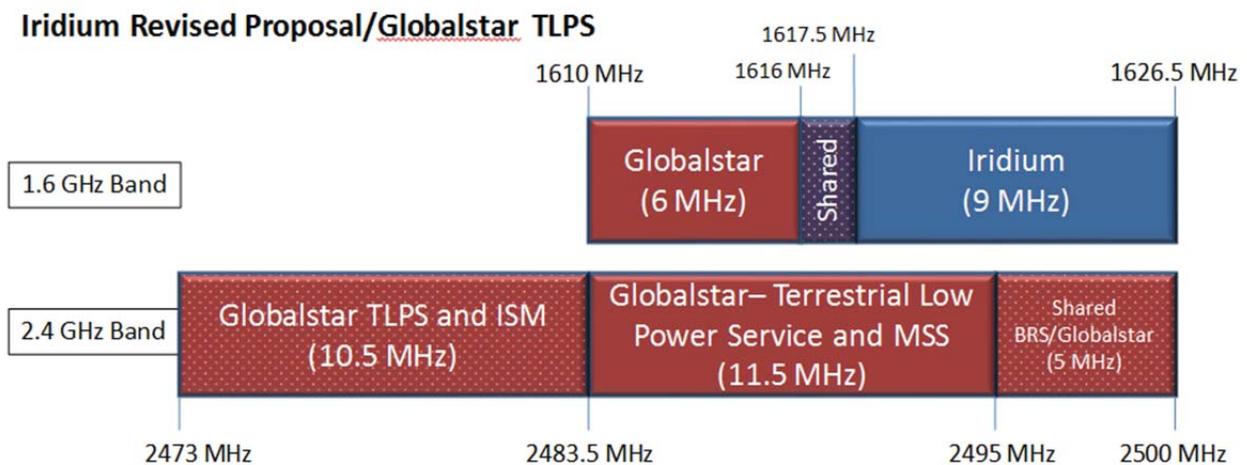
¹⁰ Because Globalstar's channelization scheme uses 1.23 MHz bandwidth channels for the duplex operations and 2.5 MHz bandwidth channels for simplex, the duplex and simplex channels do not overlap exactly. Globalstar's Duplex Channel 7 actually begins at 1617.495 MHz. However, in the interest of being a good neighbor to Globalstar's operations, Iridium proposes herein that the exclusive reallocation begin at 1617.5 MHz – the upper channel edge of Globalstar's Simplex Channel C.

¹¹ See *Big LEO Second Reconsideration Order*, supra note 4.

operations wherever it operates. This means that in most places Simplex SPOT services, which Iridium understands to be low-bandwidth and relatively interference-resistant, will be the only Globalstar solution available. Even in the places Globalstar does offer duplex service, it will lack one of the major strengths of MSS, its ubiquity, making it unlikely that Globalstar’s system approaches full loading, and reducing the technical challenges related to spectrum sharing identified by the Commission in 2007.¹²

Shared access to the 1616-1617.5 MHz spectrum also will address Globalstar’s purported equipment challenges. Because it will continue to have access to the spectrum on a shared basis, Globalstar will not need to recall and reprogram its SPOT devices, and it will remain able to make initial access calls from its duplex devices across the United States. From Iridium’s perspective, however, access to this additional spectrum, even on a shared basis, will allow it to reap the full benefits of its constellation design, which is optimized for operations across 10.5 megahertz of L-band spectrum.

An illustration of Iridium’s revised spectrum proposal is below.



This revised proposal will best address each of the three observations identified by

¹² *Id.*, ¶¶ 14-15.

Iridium above. By giving Iridium access to a small amount of additional exclusive spectrum and another 1.5 megahertz on a shared basis, the proposal will ensure sufficient spectrum availability to foster continued MSS growth in the near term. Additionally, it addresses the interference concerns alleged in Globalstar's Opposition, and does so in a way that is consistent with and fosters Globalstar's self-identified post-TLPS business model. The Commission should act promptly on Iridium's Petition, based on the record compiled in the above captioned proceedings and the revised proposal put forth in this letter.¹³

III. CONCLUSION

Iridium is committed to the continued success and development of innovative Big LEO Band MSS. Its initial Petition for Rulemaking was submitted with the intent of promoting this vision. Herein, Iridium has proposed an approach to spectrum assignments in the L-band portion of the Big LEO Band that is designed to accomplish two goals in the near-term: first, to ensure sufficient spectrum to foster the continued growth of Big LEO MSS; and, second, to address the potential challenges Globalstar identified in its Opposition, which are rooted in technology and band plan choices that the company made with its legacy devices. The Commission can and

¹³ The Commission historically has adjusted the Big LEO MSS band plan through rulemaking proceedings of general applicability affecting all MSS operators in the band. *See, e.g., Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands, IB Docket No. 02-364, Report and Order, Fourth Report and Order, and Further Notice of Proposed Rulemaking*, 19 FCC Rcd 13356, ¶ 85 (2004). However, no rule changes are required to effectuate the relief requested by Iridium, and all potentially affected operators have participated in this proceeding. As such, the Commission has ample authority and discretion to proceed directly to a license modification under Section 316 of the Communications Act, should it choose to do so. 47 U.S.C. § 316.

should act on this proposal promptly in order to promote the public interest in ensuring new and improved Big LEO MSS for consumers in the U.S. and around the world.

Respectfully submitted,

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