

**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)	
)	
)	

REPLY OF IRIDIUM CONSTELLATION LLC

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EXECUTIVE SUMMARY

Iridium is the sole Big LEO MSS provider exclusively and successfully focused on delivering advanced and reliable satellite services to meet the critical communications needs of first responders, the U.S. government, businesses, and consumers across the entire globe, whether on the ground, in the air, or at sea. Iridium is constantly innovating and developing new MSS applications beyond its core voice and data services, including diverse and higher-speed data products, consumer smartphone hotspots, commercial push-to-talk, M2M, scientific monitoring, and many other solutions. Moreover, Iridium will soon submit an application seeking authority to deploy its next-generation satellite system, Iridium NEXT. Iridium NEXT will bring increased data speeds, higher quality voice, a range of new public safety, enterprise, and consumer applications, and support for a global air traffic monitoring system that leverages the next-generation air traffic control method already being adopted around the world.

In its Petition, Iridium proposed that 2.725 megahertz of the more than 25 megahertz of Big LEO Band spectrum available for CDMA MSS use be made available for exclusive use by TDMA MSS systems. This modest rebalancing of the Big LEO band plan will free up spectrum that can be immediately put to use in the public interest by Iridium, while also helping to ensure that there is sufficient spectrum to support the continued growth and development of Big LEO MSS throughout the 15-20 year expected life of Iridium NEXT. Moreover, the proposed reassignment will not hinder the business plans of the other Big LEO band operator, Globalstar. Even after this spectrum reassignment, which will provide 10.5 megahertz of contiguous L-Band spectrum for Iridium's MSS operations, Globalstar will continue to have access to more than 22 megahertz of Big LEO band spectrum (not including the nearly 11 megahertz of unlicensed spectrum it seeks to convert for its licensed terrestrial use), more than enough to pursue its

primary terrestrial ambitions and also conduct the nominal MSS operations it has planned for its replacement satellites.

Neither Globalstar nor its investors have offered any compelling arguments as to why the Commission should not initiate a rulemaking proceeding to consider Iridium's proposals. Although Globalstar asserts that its self-imposed and inefficient channelization scheme prevents the spectrum reassignment sought by Iridium, it does not—and likely cannot—offer any shred of technical analysis or evidence in support of this position. Similarly, while the Globalstar investors allege substantial economic harm would come to Globalstar should Iridium's proposal be approved, they disingenuously ignore that Globalstar's corporate value is almost entirely based on its 2.4 GHz band terrestrial ambitions, which would be totally unaffected by Iridium's proposal.

The Commission has long maintained that it would reevaluate the Big LEO band MSS spectrum sharing regime from time to time as the public interest dictates. More than a decade has passed since the Commission initiated its previous reexamination. In that time, substantial regulatory and market changes have occurred to justify the proceeding proposed by Iridium. Among these are the steady stream of competitive MSS operators choosing to convert their spectrum to terrestrial use, Globalstar's own desire largely to abandon the Big LEO MSS market, Iridium's continued innovation and introduction of services not previously contemplated for MSS, and the imminent launch of Iridium NEXT, which represents a major step forward for the industry and end user community. In light of these various changed circumstances, the Commission should add the issues raised in the Iridium petition to the ongoing TLPS rulemaking to conduct a single proceeding addressing the future of MSS operations in the Big LEO MSS band.

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REPLY OF IRIDIUM CONSTELLATION LLC

Iridium Constellation LLC (“Iridium”), by its attorneys, hereby submits its Reply to the Opposition of Globalstar, Inc. (“Globalstar”)¹ and the Comments of the Globalstar Investors² filed in response to Iridium’s Petition for Rulemaking seeking to promote expanded mobile satellite service (“MSS”) in the Big Low Earth Orbiting MSS (“Big LEO MSS”) band.³

I. INTRODUCTION

Iridium is one of the last remaining MSS operators laser-focused on providing innovative and reliable MSS, and it is the only such operator in the Big LEO band. To ensure continued access to spectrum for future Big LEO MSS needs, Iridium’s Petition proposed a modest

¹ See Opposition of Globalstar, Inc. to Petition for Rulemaking, RM-11697 (filed Dec. 2, 2013) (“Globalstar Opposition”).

² See Comments of the Globalstar Investors, RM-11697 (filed Dec. 2, 2013) (“Globalstar Investors Comments”).

³ See Iridium Constellation LLC, Petition for Rulemaking, RM-11697 (filed Feb. 11, 2013) (“Petition”).

reassignment of 2.725 megahertz of L-Band spectrum (1616-1618.725 MHz) for the exclusive use of time division multiple access (“TDMA”) MSS systems. In the end, this will create a contiguous 10.5 megahertz segment of L-Band Big LEO MSS spectrum that Iridium can use immediately to serve the public interest and that will support continued MSS development and innovation for improved end user experiences in the future.

As detailed further below, Globalstar and its investors offer no compelling arguments in opposition to Iridium’s Petition. Iridium’s Petition represents a sensible and forward-looking approach to ensuring sufficient spectrum for current and future MSS operations. Contrary to Globalstar’s assertions, Iridium’s Petition is neither anticompetitive, nor would it hinder Globalstar in pursuing its MSS or TLPS business plans. Instead, Iridium’s Petition was filed in response to significant changes in the regulatory and market environment for MSS and to protect the Big LEO band as one of the last bastions of pure MSS. Any suggestions to the contrary should be dismissed. Therefore, the record developed in this proceeding demonstrates that the Commission should promptly grant Iridium’s Petition and add the issues raised therein for consideration in the ongoing rulemaking proceeding examining Globalstar’s proposal to convert the 2.4 GHz S-Band portion of the Big LEO MSS band to terrestrial use.⁴

II. IRIDIUM’S PETITION PROVIDES A COMPELLING CASE FOR ALLOCATING ADDITIONAL SPECTRUM FOR ITS MOBILE SATELLITE SERVICE.

As Iridium’s Petition demonstrated, and no party refuted, Iridium is solely and successfully committed to growth and innovation in MSS in the Big LEO band. Iridium’s highly efficient MSS provides important public interest benefits not achievable with any other form of

⁴ 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*, FCC 13-147 (rel. Nov. 1, 2013) (“TLPS NPRM”).

communications, for first responders, the U.S. government, critical maritime and aeronautical needs, and consumers, particularly during times of emergency or natural disaster. Iridium's success in the MSS market has led to steadily increasing demands on its system, and this trend is expected to accelerate with the imminent launch of Iridium's next-generation satellite system, Iridium NEXT. Iridium's Petition seeks a modest reassignment of 2.725 megahertz of L-Band Big LEO MSS spectrum to support continued expansion and development of MSS in the future.

A. Iridium Provides Essential Satellite Services Extremely Efficiently in a Limited and Unpaired Spectrum Assignment.

A U.S.-based and U.S.-licensed company from the beginning, Iridium operates the world's largest commercial satellite constellation, consisting of sixty-six low-Earth orbiting, cross-linked satellites operating in a fully meshed network. Iridium's unique satellite system enables it to serve the critical communications needs of first responders, the Federal Government, aid organizations, medical care providers, and private users across the entire globe. Iridium's services are essential to the public interest, as satellite services are often the only form of connectivity available in remote areas or times of disaster when terrestrial networks are compromised. Remarkably, Iridium sustains this highly reliable, advanced, global system on only 8.725 megahertz of unpaired L-Band service link spectrum (1617.775—1626.5 MHz), 0.95 megahertz of which currently is shared with Globalstar (1617.775—1618.725 MHz).

In highlighting the important public interest in favor of maintaining robust MSS capabilities, the Commission has noted that "MSS systems can provide communications in areas where it is difficult or impossible to provide communications coverage via terrestrial base stations, such as remote or rural areas and non-coastal maritime regions, and at times when

coverage may be unavailable from terrestrial-based networks, such as during natural disasters.”⁵ Iridium epitomizes this statement, and its efficient, reliable, and ubiquitous satellite system has provided services for every major natural disaster and similar emergency since the launch of its constellation.

For example, Iridium’s services were essential to response and recovery efforts after Hurricanes Katrina and Rita. As was explained in a letter to the Commission at the time, Iridium’s services helped keep regional first responders connected when other communications systems failed.

As a captain with the Sulphur Fire Department in Louisiana, I can attest first-hand to the power of Iridium’s mobile satellite communications service in a large scale disaster . . . [t]he Iridium-based unit enabled us to be in constant contact with our department over 200 miles away while standing in 12’ of water at the scene.⁶

Additionally, U.S. Army Brigadier General Mark A. Graham testified before Congress that his team, which was responsible for setting up Operational Command Posts in New Orleans that ultimately coordinated the evacuation of over 65,000 displaced persons in a 72-hour period, “provided [their] communications using Iridium satellite phones”⁷ Importantly, Iridium was able to accommodate reliably the increased demand caused by the Gulf hurricanes in part due to Commission-granted special temporary authority to access the 1616-1618.25 MHz

⁵ Fixed and 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, *Notice of Proposed Rulemaking and Notice of Inquiry*, 25 FCC Rcd 9481, ¶ 33 (2010) (“*MSS NPRM and NOI*”).

⁶ See Iridium Satellite LLC, Written Ex Parte Presentation at 3, IB Docket No. 02-364 (filed Mar. 24, 2006) (*citing* Letter from Captain Brandon Blalock, Office of the Fire Chief, Sulphur Fire Department, to Chairman Kevin Martin, Federal Communications Commission (Oct. 21, 2005)).

⁷ *Id.* (*citing Hurricane Katrina: Managing the Crisis and Evacuating New Orleans: Hearing Before the Senate Comm. On Homeland Security and Governmental Affairs*, 109th Cong. (Feb. 1, 2006) (statement of Brigadier General Mark A. Graham, Deputy Commanding General of the Fifth United States Army/Army North)).

segment of the Big LEO band—which includes the spectrum Iridium seeks access to in the instant proceeding.⁸ Moreover, Iridium was able to conduct these operations at a time of extreme system loading with Globalstar’s awareness and cooperation.

More recently, Iridium’s services were also heavily deployed in response to the 2011 Texas Wildfires, Superstorm Sandy, the earthquake in Haiti, and the typhoon in the Philippines. In the example of the regional humanitarian support in the Philippines, Iridium system usage increased greater than 150 times nominal usage immediately after the hurricane as first responders and aid agencies rushed in to support recovery efforts. Indeed, the International Telecommunication Union recognized the crucial role of Iridium products in responding to this disaster when it sent an emergency dispatch of Iridium handsets to regional first responders immediately after the event.⁹ Iridium’s products also were essential to firefighters and first responders during the devastating 2011 Texas wildfires. Iridium devices allowed firefighters to communicate with each other where there were no reliable terrestrial networks, and also provided positioning coordinates to helicopters and communication with hospitals when rescuing people from harm.¹⁰ In each of these events, demand on Iridium’s system spiked in response to the need for reliable communications during times where terrestrial systems were compromised. A key characteristic of Iridium’s system, which is unique among Big LEO MSS providers, is that it can immediately provide all of its core functionality without local or regional ground

⁸ See, e.g., IBFS File No. SAT-STA-20050901-00171.

⁹ See International Telecommunication Union, Press Release: ITU deploys satellite communication equipment to the Philippines, http://www.itu.int/net/pressoffice/press_releases/2013/55.aspx (Nov. 13, 2013).

¹⁰ See Ted O’Brien, “Are You Ready” Iridium 360°, <http://www.iridium360.com/2011/08/03/are-you-ready/> (Aug. 3, 2011).

infrastructure. This feature, combined with Iridium's extensive constellation, allows Iridium's MSS to be always available, on demand, anywhere on Earth.

As explained in Iridium's Petition, in addition to the life-saving services discussed above, Iridium supports a range of other highly reliable, mission-critical communications around the globe.¹¹ These include voice and data service provided to the U.S. military, Drug Enforcement Administration, and Border Patrol; transceivers deployed out at sea to support scientific research and tsunami monitoring; and diverse commercial applications such as maritime voice and data, machine-to-machine communications, and global asset tracking. Moreover, through its Aireon LLC joint venture, Iridium will be providing new, unique, and critically important next-generation air traffic management services using data from the same automatic dependent surveillance-broadcast ("ADS-B") equipment that airlines are in the process of installing on their fleets.

B. Demands on Iridium's System Have Grown Consistently and Are Expected to Continue Growing, Which Will Drive Spectrum Needs.

Iridium's dedication to and success in MSS innovation has led to significant growth in use over the life of its current generation system. Data collected by Iridium demonstrate the historic growth in use of its system. For example, looking over the last ten years, the daily maximum number of connections per satellite was more than seven times greater in 2013 than in 2003. The minutes of use have skyrocketed even more, having multiplied by a factor of fourteen over the same period. This consistent increase in Iridium's utilization has been driven by the company's responsiveness to its end users and the sustained need for robust and reliable communications capability in the most challenging environments. Today, Iridium is one of the

¹¹ See Petition at 9-12.

largest providers of voice and data mobile satellite service, and ended 2012 with 611,000 total billable subscribers.

Iridium's historic growth is expected to continue, driven by the introduction of new products and services enabled by upgrades in Iridium's constellation and its innovative vendor partnerships. Most importantly, Iridium soon will file a modification application seeking authority to launch and operate its next-generation constellation, Iridium NEXT. When launched, Iridium NEXT will bring significant advances above the capabilities of the current constellation that will drive increased use by existing customers and open up new markets to Iridium's services. Ultimately, Iridium NEXT will deliver data speeds of up to 1.5 Mbps (up from 128 kbps), enabling Iridium NEXT to provide broadband services to unserved areas (without the need for terrestrial infrastructure or the creation of MSS exclusion zones, as would Globalstar's proposed TLPS). Experience in terrestrial networks has demonstrated that increases in data rates drive increases in demand. Iridium expects the same to hold true with Iridium NEXT, and the increase in global data demand will make concomitant demands on Iridium's spectrum.

In addition to the higher data rates offered by Iridium NEXT, Iridium, in conjunction with its partners, continues to develop unique products and applications that will leverage the reliable, ubiquitous connectivity provided by Iridium's system in exciting new ways—including advanced geolocation capabilities, netted broadband, global commercial push-to-talk, mobile voice/data hotspots, portable virtual P25 land mobile radio networks, global data broadcast services, and large-scale higher-speed M2M solutions—and also improve the quality of its core services.¹² For example, Iridium plans to create a high-quality voice codec with Iridium NEXT.

¹² Petition at 14-15.

Additionally, Iridium plans to build upon its innovative AxxessPoint product, which enables users to connect their Android or iOS smartphone to Iridium's constellation, through the introduction of additional hotspot capabilities offered at consumer-friendly prices for both the hardware and data service. These products will enable expanded connectivity outside of terrestrial coverage using devices end users already carry, either for general purpose communications or for purpose-built apps for use in remote locations.

Beyond the above products, Iridium continues to innovate for its core enterprise, government, and public safety customers. To illustrate, Iridium has described in detail elsewhere its Netted Iridium[®] commercial push-to-talk ("PTT") solution that is an evolution of technology originally developed for military use.¹³ Netted Iridium, which will allow a low-latency PTT experience either within a localized area or across the globe, is expected to bring new users to the network and drive incremental traffic and use from existing users. Moreover, Iridium plans to improve the Netted Iridium service to go beyond delivery of voice and simultaneous position/location information to higher speed netted broadband connections for military command and control in contested environments, and the broadcast of pictures and videos efficiently from one user to many users during emergency/first responder situations.

While each of Iridium's services is designed to be highly efficient, additional spectrum will ensure Iridium's ability to offer all of them in a high volume at a low cost. Iridium continues to offer entirely new products and services for use on both the current system and Iridium NEXT. By providing new communications capabilities to a wider range of users beyond traditional circuit switched voice and data service, these services will attract diverse new market segments to Iridium's system. However, each new introduction must make use of the same L-

¹³ See, e.g., Comments of Iridium Satellite LLC at 5-6, PS Docket Nos. 06-229, 12-94, WT Docket No. 06-150 (filed May 24, 2103).

Band Big LEO MSS spectrum and places new demands on this limited resource originally intended to support only Iridium's legacy services. For example, while Netted Iridium is an extremely efficient user of spectrum within the footprint of a single satellite, where multiple devices can share the same spectrum, the service becomes more spectrum-intensive when expanded to global use. Similarly, Iridium expects the new high quality voice codec to use at least twice the network capacity as the current voice codec. Especially as Iridium prepares for the launch of Iridium NEXT, which is expected to further catalyze this innovation, it will be increasingly important to ensure that it has sufficient spectrum available to support this expansion as well as sustain its core business.

C. Iridium's Petition for Rulemaking Seeks to Ensure Sufficient Spectrum for Future Satellite Growth.

In light of Iridium's demonstrated commitment to MSS, history of sustained growth, and expected innovation-driven demands in the future, Iridium's Petition seeks a modest reassignment of 2.725 megahertz of Big LEO spectrum. This spectrum, which can be immediately put to use, will allow for growth and improvement of existing service and will support the development and deployment of new services. Iridium's Petition comes at an important moment for the future of mobile satellite services. As Iridium plans for the launch of Iridium NEXT, Iridium and the Commission must consider not only its spectrum needs today, but Iridium's long-term needs throughout the 15-20 year expected life of the constellation. With the dedication of the 1.5/1.6 GHz and 2 GHz Band MSS operators to terrestrial business plans, and the Commission's reexamination of the Big LEO band rules in the context of the TLPS NPRM,¹⁴ this may be the last opportunity to ensure that there is sufficient spectrum available for

¹⁴ See generally TLPS NPRM.

the continued growth and development of robust, innovative, and reliable MSS operations that are so crucial to the public interest.

III. REASSIGNMENT OF LESS THAN 3 MEGAHERTZ OF L-BAND SPECTRUM TO IRIDIUM WOULD NOT HARM GLOBALSTAR'S EXISTING OR FUTURE BUSINESS PLANS.

Iridium's Petition seeks reassignment of 2.725 megahertz of L-Band Big LEO MSS spectrum, which will neither compromise Globalstar's existing or future MSS business, nor hinder its proposal to acquire an exclusive license to deploy a managed terrestrial network over 11 megahertz of unlicensed Industrial, Scientific, and Medical ("ISM") spectrum and its own 2.4 GHz S-Band spectrum. Rather than harming Globalstar, Iridium's Petition is entirely focused on ensuring that there is sufficient spectrum available to support growth and innovation in Big LEO band MSS, as described above. Despite Globalstar's assertions that Iridium's petition is anticompetitive in motivation, in truth the petition is pro-competitive because it would address the current inequity in spectrum allocation by moving toward a fairer band plan that provides sufficient spectrum for Globalstar's existing and future MSS operations and also facilitate further innovation in Big LEO MSS. While Globalstar's U.S. business plans seem focused on exploring terrestrial deployment options, to the detriment of its replacement satellite system, Iridium is focused on provision of MSS and is seeking to expand the capabilities of its core services.

A. Globalstar's MSS is Focused on Low-Bandwidth Simplex SPOT Services that Would not be Harmed by Iridium's Proposal.

Despite emphasizing its duplex voice services, SPOT—essentially a satellite-based one-way paging or messaging service—is the predominant use for Globalstar's L-band spectrum and accounts for 80 percent of its subscribers. Although Globalstar details the asserted public

interest benefits of SPOT,¹⁵ the company does not attempt in its Opposition to demonstrate the actual spectrum needs for this service sufficiently to support the channelization structure the company has chosen. Nor has it offered more than unsupported assertions regarding the spectrum needs of its proposed future services.

SPOT is a short burst data service with sporadic transmissions of very little content. Iridium understands that typical SPOT usage consists of transmission of six position reports (each only 9 bytes in length) per day. Conventional terrestrial paging services use channel-widths ranging from 20 kilohertz to 150 kilohertz.¹⁶ By comparison, Globalstar has set aside 2.5 megahertz channels to accommodate its SPOT service. Considering the design of CDMA technologies, which are intended for intensive sharing of the same spectrum without self-interference, and the small message size and period usage of SPOT, 2.5 megahertz channels likely are capable of supporting a very large number of devices in each location. As the SPOT service is designed to be utilized: (1) only in emergencies and (2) only in remote locations, it strains credulity that Globalstar would require more than eight megahertz of L-Band spectrum to sustain this low bandwidth service across its service area. Without further explanation, Globalstar has not demonstrated how the modest spectrum reassignment proposed by Iridium would negatively impact continued SPOT operations.

¹⁵ It should be noted that even the public benefits of SPOT are not fully established by Globalstar. While Globalstar states that SPOT devices have been used in 2,791 emergency rescues, it explains neither in how many cases SPOT was instrumental to this rescue nor the number of false alerts triggered by SPOT devices. For example, an analysis of SPOT usage within three California national parks over a course of nearly four years found that of the 77 calls triggered by the devices, “48 percent had no merit at all.” Scott Carney, *Panic Button*, OUTSIDE MAGAZINE, <http://www.outsideonline.com/outdoor-adventure/outdoor-skills/survival/Panic-Button.html>, June 29, 2011. If these statistics are representative, SPOT devices may be responsible for over 2,500 false alarms, wasting unknown hundreds of thousands of dollars of public safety resources in response.

¹⁶ See, e.g., 47 C.F.R. §§ 22.531, 24.129.

Globalstar also has not articulated clear plans for its future MSS offerings or their spectrum needs. For example, Globalstar makes much of its planned aviation services,¹⁷ yet the details of these plans seem unclear and speculative. Despite its attempts to conflate its proposed aviation MSS with the next-generation air traffic control technology ADS-B, it is noteworthy that Globalstar is not actually proposing to utilize ADS-B signals per se. Instead, Globalstar proposes an ADS-B Link Augmentation System (“ALAS”), an ancillary service that will rely upon the installation of new proprietary equipment on aircrafts and associated ground infrastructure.

Globalstar suggests that Iridium’s Petition was submitted with anticompetitive aims on its ALAS,¹⁸ however this is both untrue and nonsensical. Iridium, through its Aireon LLC joint venture, will soon be offering satellite-facilitated ADS-B service that will leverage the investment airlines are already making in commercial ADS-B infrastructure without the need for additional equipment investment. Aireon’s space-based ADS-B solution is being developed with support from air navigation service providers such as the Federal Aviation Administration (“FAA”), NAV CANADA, National Air Traffic Services (“NATS”), and in cooperation with the International Air Transport Association (“IATA”) and the International Civil Aviation Organization (“ICAO”). Nothing in the Aireon service offering would prevent the operation of Globalstar’s ALAS, were Globalstar actually to get the necessary approvals and demonstrate adequate performance required to provide aviation services. To the extent Globalstar’s hypothetical aviation services are ever brought to market, Iridium does not see these services as a

¹⁷ See Globalstar Opposition at 9-10.

¹⁸ *Id.* at 23.

direct competitor to Aireon, and there is no basis for concluding that Iridium's Petition is intended to, or would actually harm the competitive viability of these services.

B. Globalstar's Petition Suggests an Emphasis on Terrestrial Growth at the Expense of Big LEO MSS.

In evaluating the potential impact of Iridium's proposal on Globalstar's business operations, it is not unreasonable for Iridium and the Commission to consider Globalstar's terrestrial plans as suggesting a focus on terrestrial deployment at the expense of Big LEO MSS. Globalstar's petition for rulemaking sought elimination of the MSS ATC gating criteria, including the obligation to provide a substantial satellite service across the United States, the obligation to maintain spare satellites, and the obligation to ensure that terrestrial services are integrated with MSS.¹⁹ It is unclear why Globalstar would have sought this relief unless it planned to suspend regular MSS operations in substantial areas of its footprint in favor of terrestrial service. All but confirming this interpretation, when the Commission's TLPS NPRM proposed to remove all MSS/ATC obligations but a symbolic requirement that Globalstar offer commercial MSS somewhere in its footprint,²⁰ Globalstar was overjoyed, emphasizing that the proposed rules gave it exclusive flexibility to deploy a terrestrial network "how, where, when, and with whom" it chooses, without any concomitant build-out obligations.²¹

More than just an operational choice, it appears based on Globalstar's petition and public statements that its proposed terrestrial operations are technologically inconsistent with MSS operations, and would preclude MSS from being delivered wherever TLPS is deployed.

¹⁹ Globalstar, Inc., Petition for Rulemaking to Reform the Commission's Regulatory Framework for Terrestrial Use of the Big LEO MSS Band, RM-11685, at 30-31 (filed Nov. 13, 2012) ("Globalstar Petition").

²⁰ TLPS NPRM at 11, ¶ 26.

²¹ Q3 2013 Globalstar, Inc. Earnings Conference Call at 27:06, *available at* <http://phx.corporate-ir.net/phoenix.zhtml?c=203507&p=irol-eventDetails&eventID=5053955>.

Although this issue requires clarification in the context of the TLPS NPRM—which is part of the reason Iridium continues to seek consolidation of these proceedings—the TLPS concept seems to envision that terrestrial service would preempt satellite operations. This is a complete reversal of the ancillary terrestrial component policy, in which terrestrial operations were intended to be a complement to primary satellite services, not a mutually exclusive replacement.

Globalstar’s long-term LTE proposal also is inconsistent with provision of MSS and undermines the credibility of its arguments against Iridium’s proposal. Globalstar has declared an aspiration of leveraging its L-Band spectrum to support LTE mobile devices. However, LTE is typically deployed with an uplink channelization of at least five megahertz. If Globalstar’s assertions about its L-Band spectrum needs and deployment challenges are to be believed, it would seem that dedicating five megahertz of its L-Band spectrum to LTE mobile use would be wholly incompatible with a long-term commitment to MSS operations in the band. Globalstar’s LTE proposal leads to one of two logical conclusions: either Globalstar is overstating the risk to its L-Band services posed by Iridium’s Petition, or it is overstating its own commitment to MSS and instead sees Iridium’s proposal as a threat to its long-term plan of converting the L-Band Big LEO spectrum to terrestrial use. In either case, the Commission should give no credence to its claims.

It is cynical and fallacious for Globalstar to claim that it is committed to MSS while at the same time earnestly pursuing technologies that cannot coexist with satellite services; however, Globalstar’s economic motivations are clear. Globalstar is near to realizing the business plan that has been its sole corporate focus for years—wholesale conversion of its mobile satellite service spectrum to robust terrestrial deployment—and the potential to do so is driving a substantial increase in value for Globalstar and renewed interest by the investment

community. According to figures reported on Globalstar's website, from the day before its Petition for Rulemaking was submitted to the first business day after the TLPS NPRM was released, Globalstar's stock value more than quintupled, rising from \$0.32 per share to \$1.65.²² And to dispel any doubt as to the source of this rise, industry analysts recently valued Globalstar's satellite business at \$500 million, while placing the value of the spectrum at anywhere from \$1.1 billion to \$8.7 billion.²³

Under these circumstances it is only logical that Globalstar would pursue the terrestrial venture at the exclusion of satellite services. For Globalstar, launching a satellite system is essentially a capital expenditure to deploy terrestrial broadband without paying auction fees or having to comply with build-out obligations. While this is an economically rational course of action for Globalstar, the Commission should recognize it for what it is and not allow Globalstar to obstruct Iridium's mission of delivering high-quality, reliable, and innovative MSS to first responders, the U.S. Government, and the public because of disingenuous claims about the potential for interference to Globalstar's satellite system.

IV. GLOBALSTAR OVERSTATES THE POTENTIAL FOR HARMFUL INTERFERENCE TO ITS MSS FROM IRIDIUM'S PROPOSAL.

Globalstar's claims of potential interference should Iridium's proposal be adopted are little more than unsupported assertions without real evidence or analysis. Globalstar asserts that

²² See Globalstar, Inc., "Stock Information" <http://www.globalstar.com/en/index.php?cid=6090> (last visited Dec. 11, 2013) (compare November 12, 2012 with November 4, 2013).

²³ New Street Research, Company Note, "Innovators & Disruptors; GSAT: An Innovative & Potentially Valuable Spectrum Play" (Nov. 4, 2013) (on file with author) Another analyst has forecast the value of Globalstar's stock rising potentially as high as \$5.00 based upon a successful NPRM and subsequent M&A interest. Elevation LLC, "Steve Sweeney - TMT Long/Short Equity Ideas" (Dec. 5, 2013) (on file with author). However, the same analyst valued the Globalstar stock at \$0.75 if the NPRM fails, further underscoring that the terrestrial business is the sole driver of Globalstar's market value.

without the 2.725 megahertz of spectrum Iridium proposes for reassignment, it would be left with insufficient spectrum to operate a successful mobile satellite service because of self-interference and the need to protect adjacent services. The fact remains, however, that Globalstar has substantially more MSS spectrum at its disposal than Iridium, yet it serves significantly fewer customers. Even assuming the validity of its questionable channelization scheme, after the reassignment proposed by Iridium, Globalstar would have enough spectrum to operate more than two simplex channels and nearly five duplex channels. Globalstar has not explained how this would be insufficient to sustain its MSS operations, especially given its terrestrial ambitions. At a minimum, this lack of support suggests a point for further examination in a rulemaking.

A. Globalstar Offers No Support for its Assertions that its L-Band Spectrum is Second-Class or “Significantly Encumbered.”

The Commission should reject Globalstar’s unsupported suggestion that reassignment of 2.725 megahertz of L-Band spectrum to Iridium “would have a disastrous effect on Globalstar’s global MSS business”²⁴ After the reassignment sought by Iridium, Globalstar would be left with more than two full simplex channels and nearly five full duplex channels under its current channelization.²⁵ Globalstar simply has not demonstrated that this remaining spectrum is insufficient to accommodate its current and future MSS operations, or that the modest reassignment sought by Iridium would otherwise negatively impact its MSS business. Indeed,

²⁴ Globalstar Opposition at 12.

²⁵ Globalstar’s duplex channel 5 has an upper band edge at 1616.265 MHz. Considering the disparity in spectrum holdings between the two companies, Iridium’s long-standing commitment to critical MSS and demonstrated needs for additional spectrum, and Globalstar’s corporate shift toward 2.4 GHz band terrestrial opportunities, any minor overlaps with Globalstar’s channelization scheme should be resolved in Iridium’s favor.

Globalstar likely cannot support this claim because Iridium has operated on this same spectrum repeatedly in the past, pursuant to Commission-issued special temporary authorization.²⁶

The various technical and interference-based arguments raised by Globalstar are speculative and not supported with evidence. For example, Globalstar asserts that it has segmented its L-Band spectrum into three 2.5 megahertz-wide simplex channels,²⁷ but it does not provide any actual information about the technical operations of this service, nor does it explain why a simplex service carrying very little data requires channel-widths twice the size of its duplex voice service. At a minimum, the Commission should require Globalstar to provide actual engineering studies that fully detail the link budgets and receive thresholds that the Globalstar MSS system utilizes to provide service and demonstrate how the various services that it has arbitrarily segregated would self-interfere if the services are provided in a more rational amount of spectrum. Iridium is unaware of any substantial technical or engineering study provided by Globalstar in the entirety of the previous Big LEO spectrum allocation proceedings demonstrating that Globalstar has cabined off its various services for any reason other than spectrum warehousing. Considering the ambiguity regarding the alleged impact of Iridium's proposals on Globalstar's future MSS needs, the Commission appropriately could conduct a rulemaking proceeding to develop a full record on these points.

²⁶ See, e.g., SAT-STA-20050901-00171 (granting Iridium STA for additional spectrum following Hurricane Katrina); SAT-STA-20050923-00180 (granting Iridium STA for additional spectrum following Hurricane Rita); SAT-STA-20100115-00011 (granting Iridium STA for additional spectrum following the earthquake in Haiti); SAT-STA-20110311-00052 (granting Iridium STA for additional spectrum following the earthquake in Japan).

²⁷ Globalstar Opposition at 13-14.

B. Globalstar Overstates the Impact of RAS Protection on its Post-Assignment MSS Operations.

A significant portion of Globalstar's Opposition is premised on the challenges it faces in meeting its obligations to protect the radioastronomy service ("RAS") from harmful interference.²⁸ Although Globalstar makes broad claims about the effects the modest spectrum reassignment Iridium seeks would have on its operations because of its RAS protection requirements, Globalstar again provides no technical support or other evidence for these claims. The Commission should not accept uncritically Globalstar's self-serving assertions. Instead, it should allow these issues to be fully explored in the context of a rulemaking proceeding.

Globalstar claims, without analysis, that elimination of the spectrum above 1616 MHz would preclude it from operating its SPOT and duplex services over large portions of the U.S. under its current channelization.²⁹ However, Globalstar does not consider options for mitigation of this interference potential, such as adjusting its simplex and duplex channelization to make more efficient use of the spectrum, or coordination with RAS operators.³⁰

Specifically with respect to duplex terminals, Globalstar asserts that service might be precluded across much of the country without access to the spectrum above 1616 MHz because of the inability to determine whether a device is in a protected area.³¹ Globalstar does not, however, address why it is necessary for calls to be routed through a ground station before a location fix as opposed to using GPS technology, which is installed in all of its simplex SPOT products. If Globalstar had designed its system or handsets more robustly, it would have been

²⁸ *Id.* at 15-19.

²⁹ *Id.* at 16-17.

³⁰ Under the Commission's rules, MSS and RAS operators may agree to smaller geographic exclusion zones. 47 C.F.R. § 25.213(a)(1)(v).

³¹ Globalstar Opposition at 17.

positioned to have location determined prior to channel selection, allowing the duplex terminals to utilize the appropriate channels for the area from the start. The Commission should not reward Globalstar's poor design decision through continued access to unneeded MSS spectrum that could be put to better use.

C. Globalstar has not Supported the Asserted Impact of Iridium's Proposal on its International Operations.

Globalstar similarly asserts without evidence that elimination of operating authority above 1616 MHz from its legacy constellation would prevent it from offering service in some international locations.³² Specifically, Globalstar asserts (without citation) that Russia, Ukraine, and Macedonia prohibit all MSS operations below 1616 MHz.³³ However, under the channelization scheme Globalstar purports to use, there are no complete simplex channels in its authorized spectrum above 1616 MHz. Nevertheless, Globalstar reports on its website that its SPOT messenger service is available in each of these three countries.³⁴ It is difficult to see how Globalstar could both be operating within the permissible limits of its license and also using the channelization scheme shown in its Opposition. This suggests either that Globalstar's channelization has more flexibility than suggested in the Opposition, that the restrictions on MSS operations below 1616 MHz are not as rigid as it asserts, or that Globalstar is operating outside the bounds of its license. Regardless, the Commission should not accept Globalstar's assertions in this respect without further examination.

³² *Id.* at 20-21.

³³ *Id.* at 20.

³⁴ *See* Spot LLC, "SPOT Coverage Map" <http://www.findmespot.com/en/index.php?cid=108> (last visited Dec. 11, 2013).

D. Globalstar has not Demonstrated the Spectrum Needs of its Purported Aviation Service.

Globalstar asserts that in order to meet FAA/RTCA standards for its hypothetical aviation MSS system, it must have access to spectrum above 1616 MHz.³⁵ But again it fails to offer any support for this claim or even cite to any specific FAA/RTCA restriction. The only rule part to which Globalstar cites is Section 25.213(a)(1)(iv) of the Commission's rules, which Globalstar asserts would create exclusion zones across 93.9% of the country.³⁶ However, 25.213(a)(1)(iv) applies to the entirety of the L-Band Big LEO MSS spectrum,³⁷ and Globalstar does not explain how the reassignment of spectrum above 1616 MHz would be relevant.

V. SIGNIFICANT MARKET AND REGULATORY CHANGES SINCE 2007 JUSTIFY REEXAMINING THE BIG LEO BAND PLAN

The Commission has repeatedly recognized the need for review of the Big LEO spectrum sharing plan to account for changing circumstances in the MSS marketplace.³⁸ Consistent with this approach, Iridium has requested a re-examination of the current Big LEO spectrum allocations to address substantial changes in the MSS marketplace occurring after the Commission's most recent review of the spectrum allocations in 2007.³⁹ Iridium's requested reallocation directly responds to these changed circumstances in a manner that both serves the

³⁵ *Id.* at 21-23.

³⁶ *Id.* at 22 n.31.

³⁷ 47 C.F.R. § 25.213(a)(1)(iv).

³⁸ *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 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*").

³⁹ *Petition for Rulemaking of Iridium Constellation, Inc.*, RM-11697, IB Docket No. 13-6 (filed Feb. 11, 2013) ("*Petition*").

public interest by preserving dedicated MSS spectrum and leaves Globalstar with more than sufficient spectrum to meet any demonstrable Big LEO MSS needs, as discussed above.

Contrary to Globalstar's assertion that Iridium's Petition is a "tardy request for reconsideration" of the 2007 order,⁴⁰ the substantial changes to the MSS marketplace that have occurred since 2007 justify a reexamination of the Big LEO band plan. Iridium's Petition cites numerous examples of such changes that are more than sufficient to support the commencement of a rulemaking proceeding. Among these are the exodus of numerous MSS operators, supported by changes in Commission policy, from the satellite market in favor of terrestrial business models; Globalstar's own proposals to deploy terrestrial services in both the 2.4 GHz and 1.6 GHz portions of the Big LEO band; and the introduction of new spectrum-intensive services and applications by Iridium, which will be further stimulated by Iridium NEXT. Taken together, these various developments create a very different regulatory and market environment for MSS than was present in 2003 when the Commission last commenced an examination of the Big LEO band plan.

Efforts by MSS operators to abandon satellite services in favor of terrestrial services are transforming the MSS market. The Commission recently adopted a Report and Order of Proposed Modification allowing DISH Network Corporation ("DISH") flexible, terrestrial use of 2 GHz spectrum previously assigned for MSS use.⁴¹ In addition, in the L-band, LightSquared seeks additional modification of its ATC authorization to facilitate deployment of a terrestrial

⁴⁰ Opposition of Globalstar, Inc., RM-11697 (filed Dec. 2, 2013).

⁴¹ Service Rules for Advanced Wireless Services in the 2000-2020 MHz and 2180-2200 MHz Bands, *Report and Order and Order of Proposed Modification*, 27 FCC Rcd 16102, ¶ 318 (2012) ("*AWS-4 R&O and Order*").

broadband network,⁴² and now its spectrum resources are being sold at bankruptcy, likely to a bidder with terrestrial ambitions. Each of these developments impacts the availability of MSS spectrum and represents a substantial shift by MSS operators in favor of terrestrial operations, in sharp contrast to Iridium's dedication to serving the satellite communications needs of its end users.

Specific to the Big LEO MSS band, Globalstar seeks permission for full flexibility of use for its expansive 2.4 GHz spectrum holdings so that it can deploy a terrestrial service that it openly acknowledges is incompatible with MSS,⁴³ and the Commission recently proposed to grant Globalstar much of the relief it seeks.⁴⁴ Longer-term, Globalstar seeks the introduction of mobile terrestrial broadband in both the 1.6 GHz and 2.4 GHz portions of the Big LEO band, thus transforming the fundamental character of the band, which was previously a protected home for robust MSS.

In addition to changes in the rest of the MSS market, Iridium's own actions warrant reconsideration of the Big LEO MSS band plan. Contrary to most other MSS operators, Iridium remains fully committed to providing services to address existing and future demand for MSS communications. This commitment is reflected in the launch of Iridium's next-generation constellation, Iridium NEXT, which, as discussed above, will introduce new, higher-bandwidth services to meet the needs of Iridium's expanding customer base. Iridium also continues to

⁴² See Federal Communications Commission Seeks Comment on LightSquared's Request to Modify its ATC Authorization, IB Docket No. 12-340, *Public Notice*, 27 FCC Rcd 14290 (2012).

⁴³ See L. Barbee Ponder, General Counsel & VP Regulatory Affairs, Globalstar Inc. & John A. Dooley, Managing Director, Jarvinian Wireless Innovation Fund, Fierce Live! Webinar: Globalstar's New "Wi-Fi" Super Highway (Jan. 22, 2013) ("Globalstar TLPS Presentation") (discussing MSS "exclusion zones" that would result from the use of TLPS transmitters).

⁴⁴ See TLPS NPRM.

develop and introduce innovative applications and services—such as affordable maritime broadband, push-to-talk functionality, and expanded M2M services—which did not exist even in 2007, let alone 2003 when the previous proceeding was commenced.⁴⁵

The expanded capabilities resulting from Iridium NEXT and Iridium’s ongoing innovations will increase Iridium’s long-term need for spectrum. While Iridium continues to meet customer needs using its existing spectrum allocation, the increased demand for Iridium’s MSS services, combined with a shrinking availability of MSS designated spectrum, warrants a spectrum allocation plan that safeguards MSS use of the 1.6 GHz Big LEO band. By granting Iridium’s modest reallocation request, the Commission can ensure that there is at least one dedicated spectrum block for MSS providers focused on satellite services and that there is sufficient spectrum to meet future needs.

The gradual transition of MSS operators to terrestrial ambitions, Globalstar’s efforts to transform the Big LEO Band into yet another terrestrial spectrum band, and Iridium’s sustained commitment to MSS innovation and development combine to substantially alter the factual and policy premises on which the Commission’s allocation plan is based. As a result, Iridium’s Petition does not seek “tardy” reconsideration of the 2007 Order on the grounds considered by the Commission in that proceeding. Instead, the Petition seeks a reassessment of the band plan in light of the considerable changes to the marketplace that have occurred in the interim.

Wisely, the Commission left open the possibility for the issues addressed here to be incorporated into the NPRM addressing Globalstar’s L-Band proposal.⁴⁶ The Commission should exercise that option by releasing a supplemental *Further Notice of Proposed Rulemaking*

⁴⁵ See Petition at 14-15 (discussing new applications and products offered by Iridium).

⁴⁶ See *TLPS NPRM* at n.5.

or *Public Notice* adding Iridium’s request to modify the Big LEO spectrum sharing plan for consideration in that proceeding. In the alternative, if the Commission does not want to move forward with a rulemaking on Iridium’s request, it has ample authority to conduct a minor spectrum reassignment meeting Iridium’s needs pursuant to its Section 316 license modification authority.

VI. THE GLOBALSTAR INVESTORS GROUP MISREPRESENTS THE TECHNICAL AND ECONOMIC REALITIES SURROUNDING IRIDIUM’S PETITION.

The Globalstar investors group is factually mistaken when it asserts “Iridium made an unfortunate business decision in electing to architect its mobile satellite system around TDMA technology.”⁴⁷ In fact, there are substantial advantages to Iridium’s architecture, from the perspective of an operator actually committed to MSS. As detailed extensively above and in Iridium’s Petition,⁴⁸ Iridium’s system has provided reliable, high-quality duplex MSS for years, including during the substantial period when Globalstar offered only limited simplex services. One of the great strengths of Iridium’s system design is its impressive resilience—especially compared to Globalstar’s system—because of the very limited reliance on local infrastructure. This means that in the vast majority of cases, even where there is catastrophic damage to an area, Iridium is able to provide sustained MSS immediately after a disaster.

Moreover, Iridium’s system is a much more efficient spectrum user than Globalstar’s. While Iridium has provided full duplex voice and data services across the globe using less than 9 megahertz of L-Band spectrum, Globalstar has access to over 25 megahertz of Big LEO band spectrum, over which it handles significantly less traffic and primarily has offered a one-way

⁴⁷ Globalstar Investors Comments at 5.

⁴⁸ Petition at 8-12.

paging/short message service. The fact that Iridium has been able to do so much, so reliably, with comparatively less spectrum is a powerful testament to the clear technical and business foresight that was demonstrated in the design of Iridium's system.

The Globalstar investors are also mistaken in asserting that grant of Iridium's Petition for Rulemaking would create uncertainty in the investor community or cause economic harm to the clients and shareholders of the Globalstar investors. As discussed above, Globalstar has offered no evidence of harm to its MSS operations posed by Iridium's proposal. Moreover, the value Globalstar's investors see in the company is tied to the terrestrial deployment of its network, as evidenced by the rise in share price since the submission of Globalstar's Petition for Rulemaking and the investor valuations of the company.⁴⁹ Iridium's proposal would not impact Globalstar's TLPS ambitions in the slightest, and even after the reassignment sought by Iridium, Globalstar would have ample spectrum to offer commercial MSS as would be required under the rules proposed in the TLPS NPRM.

Moreover, the Investors' economic uncertainty argument should be ignored because it is well understood that a license is not an absolute right, and is subject to revision by the Commission as serves the public interest.⁵⁰ This is especially the case in the Big LEO band where the Commission has explicitly recognized the need occasionally "to re-examine the Big LEO spectrum sharing plan in a rulemaking based on the circumstances at the time and make

⁴⁹ See *supra* note 23.

⁵⁰ See, e.g., 47 U.S.C. § 316 ("Any station license or construction permit may be modified by the Commission either for a limited time or for the duration of the term thereof, if in the judgment of the Commission such action will promote the public interest, convenience, and necessity").

additional findings to refine the use of the band to better serve the public interest.”⁵¹

Notwithstanding the Globalstar investors’ unconvincing arguments to the contrary, and as it has done repeatedly in the two decades since the band was established, the Commission should again act upon this statement and make modest adjustments to the Big LEO band plan to ensure adequate spectrum for continued MSS development and growth in the future.

VII. CONCLUSION

As detailed above, neither Globalstar nor its investors offer any compelling arguments in opposition to Iridium’s Petition. Instead, the record demonstrates that Iridium’s Petition will ensure sufficient spectrum to promote continued development and innovation in essential MSS through a modest reassignment of less than 3 megahertz from CDMA to TDMA MSS uses. As such, the Commission should promptly grant the Petition and add these issues to the ongoing TLPS rulemaking.

Respectfully submitted,

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⁵¹ 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).

Certificate of Service

I hereby certify that on this 17th day of December, 2013, I caused a true and correct copy of the foregoing "Reply of Iridium Constellation LLC" to be mailed by first class U.S. mail to:

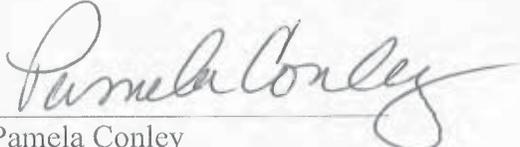
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