

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

In the Matter of)	
)	
Review of the Spectrum Sharing Plan Among)	IB Docket No. 02-364
Non-Geostationary Satellite Orbit Mobile Satellite)	
Service Systems in the 1.6/2.4 GHz Bands)	
)	
To: The Commission)	

REPLY COMMENTS OF IRIDIUM SATELLITE, LLC

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EXECUTIVE SUMMARY

In its *NPRM*, the Commission recognized that the Big LEO spectrum band plan has not kept pace with demand for MSS services or industry developments, creating a disparity in the amount of spectrum to which the two Big LEO MSS operators have access – Globalstar (27.85 MHz) and Iridium (5.15 MHz). As Iridium has clearly established in the record of this proceeding, that inequitable disparity significantly constrains Iridium’s ability to continue meeting demand and to compete in the marketplace. As a result, there is an urgent need for the Commission to act rapidly to establish an updated spectrum band plan for the Big LEO service. To that end, Iridium has proposed a balanced and fair band plan for the Big LEO service that reflects the current realities of the MSS marketplace, ensures opportunity for growth in the future, and establishes a competitive industry framework going forward.

Iridium’s proposed band plan serves the public interest by fairly reallocating spectrum in a manner consistent with the real-world needs of both Big LEO MSS operators. By allocating an additional 5.35 MHz of spectrum for TDMA/FDMA (Iridium system) use, the Commission will provide Iridium the spectrum needed to meet the ever-growing and well-documented demand for its services. Additional spectrum also will allow Iridium to introduce the improvements to its existing services (*e.g.*, reactivation of full rate voice and data) and the types of new services (*e.g.*, ATC) that are essential to remaining competitive in the MSS marketplace.

Contrary to Globalstar’s claims, Iridium clearly has documented its need for additional spectrum. The record in this proceeding clearly reflects that, without additional spectrum, Iridium will be unable to meet existing demand, enhance existing services, or introduce new services. The result will be an unacceptable competitive

disadvantage for Iridium with deleterious consequences for Iridium, the MSS marketplace, and the public interest.

Iridium's proposed band plan meets Globalstar's needs as well. The plan will provide Globalstar with sufficient spectrum to meet the current and future demands of its customers.

The proposed band plan also ensures the protection of the Radio Astronomy Service, the Global Navigation System, and ISM devices from harmful interference. It also creates opportunities for new services by reclaiming 10 MHz of spectrum to be held in reserve or allocated to whatever use the Commission deems most efficient. However, in order to avoid delaying the pressing core issues in this proceeding, the Commission should examine options for the reclaimed spectrum in a further notice of proposed rulemaking.

Unfortunately, Globalstar has reacted to Iridium's call to responsibly rebalance the Big LEO bands with self-serving claims that misstate the facts, the law, and the public interest. As is shown below, in its comments Globalstar claims that its system now requires access to nearly 28 MHz of spectrum to support its current services and ATC, but it provides no technical data to support these claims. Globalstar contends that Iridium cannot show a need for more than its existing allocation of 5.15 MHz of spectrum and that Iridium's system is inefficient. However, the Iridium system is greatly outperforming the Globalstar system, handling a volume of traffic more than 1 ½ times greater than Globalstar's in the first half of 2003, although the Globalstar system operates with access to over five times as much spectrum as the Iridium system.

Globalstar also asserts mistaken and misleading points of law and procedure, challenging the Commission's conducting of this proceeding. Nevertheless, Globalstar's claims are at odds with the terms of its license, the express language of the Communications Act, and clear Commission precedent.

Iridium's proposed band plan ensures competitive parity, adequate spectrum for both satellite operators, and non-interference between the two Big LEO systems. Indeed, Iridium's proposed Big LEO spectrum blueprint is a sound basis for achieving the Commission's goals of spectral parity and the fostering of a competitive MSS marketplace capable of delivering services and their attendant public interest benefits to the public.

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REPLY COMMENTS OF IRIDIUM SATELLITE, LLC

Iridium Satellite, LLC (“Iridium”), by its attorneys, hereby respectfully submits these reply comments in reply to comments filed in response to the *NPRM* issued in the proceeding referenced above.¹ As the Commission has recognized and as Iridium has demonstrated in its comments and discussed below, there is a compelling and pressing need for the Commission to act rapidly to establish an updated spectrum band plan for the Big LEO mobile satellite service. The current band plan is outdated and unintentionally favors one provider – Globalstar L.P. – over the only other provider in the Big LEO bands – Iridium.

A new band plan is necessary to ensure that both Big LEO system operators have adequate spectrum to meet the demand for their services, enhance their existing services, and introduce the new and innovative services critical to remaining competitive. Such a plan is essential to forming a pro-competitive framework for the future. Iridium’s

¹ 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, *Notice of Proposed Rulemaking*, FCC 03-15 (rel. Feb. 10, 2003) (“*NPRM*”).

proposed band plan is the only proposal in this proceeding that provides comparable spectrum on a non-interfering basis to both Iridium and Globalstar.

In this proceeding the Commission is addressing a scenario that it contemplated nine years ago and is approaching the issues raised in precisely the way the Big LEO operators knew—and agreed—it would. The process the Commission is following is, contrary to Globalstar’s challenges, consistent with law and Commission precedent. Iridium urges the Commission to adopt expeditiously Iridium’s proposal for a rebalancing of the Big LEO band.

I. THE BALANCED BAND PLAN PROPOSED BY IRIDIUM SERVES THE PUBLIC INTEREST

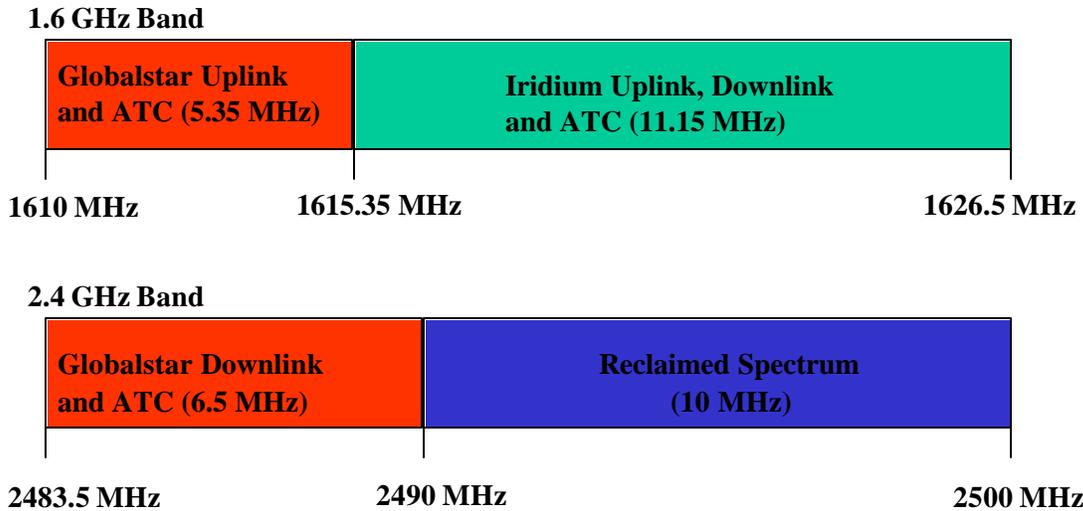
A. The Balanced Band Plan Achieves the Goal of Addressing Fairly the Needs of Both Big LEO System Operators

In its initial comments, Iridium proposed that the Commission establish an equitable and pro-competitive band plan for Big LEO licensees. Specifically, Iridium urged the Commission to reallocate an additional 5.35 MHz of spectrum for exclusive TDMA/FDMA (Iridium system) MSS use and reduce to 11.85 MHz the amount of spectrum allocated exclusively for CDMA (Globalstar) MSS use.² In addition, Iridium proposed that 10 MHz of spectrum (2490 – 2500 MHz) be reclaimed and allocated for other uses.³ This equitable solution is depicted below:

² Comments of Iridium Satellite, LLC, IB Docket No. 02-364, at 31-32, 35 (filed July 11, 2003) (“Iridium Comments”). Iridium also suggested that an additional 0.65 MHz of spectrum could be designated as a guard band between Globalstar’s and Iridium’s operations, but the precise amount of guard band spectrum could be decided by agreement of the two operators.

³ *Id.* at 36.

New Band Plan



Coupled with Iridium’s existing allocation of 5.15 MHz of spectrum (1621.35 – 1626.5 MHz), an additional 5.35 MHz would allow the Iridium system to operate at the full 10.5 MHz capacity level for which the system was originally authorized, designed, and constructed. By correcting the Big LEO band plan to create spectrum parity between the two Big LEO entities – Globalstar and Iridium – the Commission will ensure a robust, competitive marketplace for mobile satellite services (“MSS”), address the needs of both Big LEO operators, and effectively serve the public interest.

1. Iridium’s Proposed Band Plan is Consistent With, But Not in Excess of, Iridium’s Needs

As is well established in the record in this proceeding,⁴ Iridium’s Big LEO system currently operates across an amount of spectrum insufficient to meet its needs. In

⁴ In its initial comments, the Globalstar Creditors’ Committee claims that the status quo should be preserved because “the record does not support reconfiguration of the existing spectrum-sharing plan.” Comments of Globalstar Creditors’ Committee, IB Docket No. 02-364, at 2 (filed July 11, 2003) (“Globalstar Creditors’ Committee Comments”). This position makes no sense because it was made at the inception of the proceeding

particular, Iridium’s existing level of assigned spectral capacity (5.15 MHz) prevents it from meeting growing demand for its services, enhancing the quality of its existing services (including voice quality and data rates), and introducing new services essential to remaining competitive. Adoption of Iridium’s proposed band plan, however, would satisfy those needs and, in turn, ensure that the MSS marketplace remains vibrant and competitive.

a. Iridium needs additional spectrum to meet growing demand

Iridium has established in this proceeding that it is experiencing an ever-expanding level of demand for its existing services⁵ yet lacks the spectral capacity to meet that demand.⁶ As Iridium’s comments stated, demand for Iridium’s services continues to grow rapidly on both the global (350% increase in global system usage from 2001 to 2002) and regional levels (25 fold increase in regional system usage from 2001 to 2002) and is likely to continue to grow in the future (projected 190% increase in call minute utilization for 2004).⁷ Iridium’s comments also projected increased usage growth in rural parts of the U.S. and in domestic industrial applications.⁸ In addition, the comments explained that U.S. military use in theaters of military operations and the

commenced to establish that record. Indeed, Iridium’s initial comments provide ample support for spectrum rebalancing and form a strong record for the Commission to modify the existing spectrum sharing plan.

⁵ See Petition for Rulemaking of Iridium Satellite, LLC (filed July 26, 2002) (“Iridium Petition for Rulemaking”); Iridium Comments at 10-12 (discussing Letter from Richard E. Wiley, Counsel to Iridium Satellite, LLC, to the Honorable Michael K. Powell, Chairman, FCC, IB Docket No. 01-185 (Jan. 13, 2003) (“Iridium Spectrum Report”).

⁶ Iridium Comments at 10-25.

⁷ *Id.* at 16-17.

⁸ *Id.* at 18.

provision of critical services in remote or underserved areas of the world are resulting in increased demand for non-U.S. services.⁹ Finally, the comments established that the popularity of spectrum-intensive handset-to-handset service and the rapid growth of data services would further strain the Iridium system's capacity.¹⁰

The strain placed on the Iridium system by the increased demand has resulted in considerable system congestion that adversely affects the quality of service provided. Indeed, the circumstances that have led to the Commission's recent decision to grant Iridium special temporary authority ("STA") provide a striking example of the fact that Iridium's principal system limitation is a lack of spectrum access. As Iridium's experience operating under the STAs has shown, only the provision of additional spectrum can alleviate the congestion faced by the system.¹¹

The record in this proceeding also makes clear that the Iridium system has experienced capacity-related disruptions despite incorporating significant efficiency-enhancing design features. These design features include an onboard processing capability; on-board, real-time modulator/demodulator-to-beam switching capability; and

⁹ *Id.* at 18-19.

¹⁰ *Id.* at 19-21.

¹¹ Iridium's comments recount how in a January 2003 Spectrum Report to the Commission it explained that demand was growing rapidly on both a global and regional basis and that Iridium was facing an absolute capacity shortage requiring near-term action by the Commission. In addition, the comments relate that subsequent increased system use by U.S. military and Coalition forces in the Middle East Region resulted in massive amounts of system congestion and unacceptably high levels of service disruptions (*i.e.*, dropped calls and acquisition failures). The comments explain that Iridium was subsequently granted STAs to operate in additional spectrum to alleviate this congestion, *see id.* at 12-15 (discussing Stamp Grant of Special Temporary Authority, File No., SAT-STA-20030414-00066 (April 14, 2003) ("April 14, 2003 STA"); Stamp Grant of Special Temporary Authority, File No. SAT-STA-20030425-00074 (Apr. 25, 2003) ("April 25, 2003 STA")), after which the service disruptions were alleviated and the system performed as intended. *See* April 14, 2003 STA and April 25, 2003 STA; Iridium Comments at 12-15.

intra- and inter-satellite frequency reuse capabilities.¹² Iridium's comments also explained that when the Commission assigned Iridium less than half of the 10.5 MHz of spectrum over which its system was originally designed to operate, Iridium was forced to make efficiency-enhancing modifications, including the incorporation of a satellite-based, real-time, autonomous, dynamic channel management design feature that allows each satellite to assign satellite capacity to high traffic areas without ground intervention. Another major modification was the disabling of both the full rate voice and full rate data services described in greater detail below. Finally, the comments recounted Iridium's efforts to improve its satellite and gateway software to enhance satellite power control, satellite access and handoff algorithms, and to enable the introduction of low-bandwidth messaging services.¹³

All of these measures constitute a concerted and sustained effort to exploit every technological advantage available to make the Iridium system as spectrally efficient as possible. However, despite these efforts, Iridium remains in need of additional spectrum to alleviate the strain currently placed on its system and maintain the level of service quality demanded by its customers.

b. Iridium needs additional spectrum to enhance existing services and introduce new services critical to remaining competitive

In addition to eliminating system congestion, the additional 5.35 MHz of spectrum in Iridium's proposed band plan is necessary to allow Iridium to make significant improvements to existing services and adopt new and innovative services. For

¹² Iridium Comments at 27-28.

¹³ *Id.* at 30.

example, the proposed band plan will permit the use of full rate voice vocoder and full rate data capabilities. As noted in its comments, the Iridium system provided both half-rate and full-rate voice services and half-rate and full-rate data services.¹⁴ The system was designed so that where traffic demand is high, the gateway can limit some calls to half-rate, allowing the vast majority to operate at full-rate.¹⁵ However, as a result of being assigned only 5.15 MHz of spectrum, operation has been limited completely to half-rate mode since the system's original commercial activation in 1998. This reduction in voice and data rates has degraded the voice quality for subscribers and slowed the data rates at which a customer can send and access data. However, with the new band plan, Iridium will be able to modify its operations to support full rate voice channels and improved voice quality for its customers as well as higher speed data transmissions.¹⁶

The higher data rates supported by the operation of the Iridium system at full-rate vocoder modes also would allow Iridium to continue to provide and expand upon its current data services and handset-to-handset services. While packet-switched data services are more efficient for the Iridium system, demand for these services has grown at rates that outstrip even the demand for voice services. Adoption of Iridium's proposed band plan would provide the spectrum necessary for Iridium to accommodate this demand. Additional spectrum also would better position Iridium to compete with other data-focused satellite services that have access to more bandwidth than Iridium, and thus, the higher data speeds that attract customers. By operating full-rate data services, Iridium

¹⁴ Iridium Comments at 29.

¹⁵ *Id.*

¹⁶ Because the Iridium constellation contemplated such system parameters, these modifications are simply accomplished through software changes on network elements.

could support higher data rates and a greater number of data users. Similarly, Iridium could enhance its handset-to-handset service with more bandwidth, which is necessary because handset-to-handset service requires twice the bandwidth of handset-to-network voice communication.¹⁷

As a related benefit, the additional spectrum would enable Iridium to provide an ancillary terrestrial component (“ATC”) to serve its customers. The record in this proceeding reflects that the current Big LEO band plan effectively precludes Iridium from providing ATC in 5.15 MHz of spectrum.¹⁸ As Iridium explained in its comments, it “does not have frequency separation between its uplink and downlink operations” and “coordination between satellite and terrestrial use will require dynamic assignment of spectrum that cannot be technically accommodated in 5.15 MHz of spectrum.”¹⁹ Indeed, even Globalstar has recognized that advanced services, including services such as ATC, would require at least 10 to 15 MHz of paired spectrum.²⁰ As a result, without providing Iridium with sufficient spectrum to implement effective terrestrial-satellite interference protections, the Commission would place Iridium at a competitive disadvantage as other MSS providers with access to more spectrum – Globalstar and Mobile Satellite Ventures (“MSV”) – roll out ATC. While Globalstar asserts that Iridium cannot support ATC without separate uplink/downlinks, Iridium has a proven globally operational mobile satellite system that uses time division duplex (TDD) technology not reliant upon

¹⁷ Iridium Comments at 20.

¹⁸ *See id.* at 21-22; Iridium Spectrum Report at 4-6.

¹⁹ *See* Iridium Comments at 22.

²⁰ Globalstar, L.P. Petition for Reconsideration, The Establishment of Policies and Service Rules for the Mobile-Satellite Service in the 2 GHz Band, IB Docket No. 99-81, at 4 (filed Nov. 3, 2000).

segregated up/down links. As articulated in this proceeding,²¹ Iridium can clearly implement an ATC solution utilizing a TDD format, assuming sufficient spectrum is available to support proper satellite-terrestrial coordination. While 10.5 MHz, unlike 27.85 MHz, may not be sufficient spectrum in which to deploy a robust cellular network, it is certainly sufficient to deliver the MSS ATC services envisioned by the Commission.

2. Iridium's Proposed Band Plan is Consistent With, But Not in Excess of, Globalstar's Needs

Iridium's proposed band plan also is consistent with, but not in excess of, Globalstar's needs. Under the existing band plan, Globalstar was originally granted access to 11.35 MHz of 1.6 GHz spectrum and 16.5 MHz of 2.4 GHz spectrum to share with three other CDMA-based MSS operators. This afforded the CDMA and TDMA licensees access to comparable amounts of spectrum. However, three of the four CDMA licensees never constructed their systems. Consequently, Globalstar has enjoyed unintended operational access to all 27.85 MHz of the CDMA segment of the Big LEO band.²²

It appears from Globalstar's own comments that 27.85 MHz of spectrum is far in excess of what Globalstar requires and that Globalstar should be able to easily handle its current and projected customer base in the spectrum proposed for its system in Iridium's band plan. While Iridium has indicated that it does not believe that the number of

²¹ Iridium Spectrum Report at 9.

²² Globalstar has enjoyed the full, exclusive use of the band while contending that for regulatory purposes it should be treated as if it shares the band with three other CDMA operators. *See, e.g.*, Joint Comments of Globalstar, L.P. and Localstar Holdings Pty Limited to the Australian Communications Authority, at 3 (filed May 21, 2003), http://www.aca.gov.au/aca_home/licensing/radcomm/licence_fees/satellite_submissions/globalstar-localstar.pdf (contending that Globalstar should continue to enjoy a 75% discount on its spectrum fees).

subscribers is the appropriate measure of the systems' spectrum needs, Globalstar's subscriber numbers belie its own claims concerning its spectrum requirements. For example, Globalstar states that it has less than 25,000 subscribers in the United States (including the Caribbean) as of the end of 2Q 2003.²³ In arguing that Iridium currently possesses sufficient spectrum for its system, Globalstar claims that 5.15 MHz alone should be sufficient "to serve more than half a million subscribers in the continental United States."²⁴ Yet with only 25,000 U.S. subscribers, Globalstar maintains that it "is using fully and efficiently the 11.35 MHz of L-band and 16.5 MHz of S-band assigned."²⁵

On the other hand, the comments of Globalstar Canada Co. ("Globalstar Canada") seem to indicate that approximately 20% of Globalstar's subscribers are in Canada, where Globalstar utilizes fully only 3.75 MHz of spectrum (1613.75 to 1617.5 MHz) for uplink purposes (the downlink is not discussed) to accommodate "nearly 18,000" subscribers.²⁶ Obviously, these conflicting claims cannot be reconciled.

Globalstar's recent operations and activities during the period in which Iridium has been operating under STAs because of operations in the Middle East region also should be considered in the context of Globalstar's spectrum usage claims in this proceeding. In its comments, Globalstar asserts that it needs to use channels 6, 7, 8 and 9

²³ Joint Comments of L/Q Licensee, Inc., Globalstar, L.P., and Globalstar USA, L.L.C., IB Docket No. 02-364, Attachment A (filed July 11, 2003) ("Globalstar Comments").

²⁴ *Id.* at 13.

²⁵ *Id.* at 3.

²⁶ Comments of Globalstar Canada Co., IB Docket No. 02-364, at 2 (filed July 11, 2003) ("Globalstar Canada Comments").

for aviation services.²⁷ However, as Iridium’s comments relate, in the time period Iridium was granted STA to operate in 2.5 MHz (Channels 8 and 9) of the 27.85 MHz of spectrum to which Globalstar currently enjoys exclusive access, Iridium’s operations in those channels caused no harmful interference to the Globalstar system and Globalstar’s levels of service remained intact.²⁸ At no time did Globalstar claim to experience a disruption in its aviation service.

Iridium believes that its proposed band plan will result in Globalstar having access to an amount of spectrum more in line with its actual, real world needs, while at the same time protecting Globalstar’s operations. Iridium expects that Globalstar will be able to offer its services with reduced spectrum by using system efficiencies—like those already used by Iridium—and coordinating with other users of spectrum—as Iridium has done.

Iridium’s balanced band plan also ensures non-interference between Iridium and Globalstar. In particular, Iridium has proposed a guard band between the two Big LEO licensees. These measures will ensure Iridium’s plan is consistent with the needs of all affected parties in the band.

3. Iridium’s Proposed Band Plan is Consistent With Creating Opportunities For New And Expanding Services

As noted above, Iridium’s band plan also calls for the Commission to reclaim 10 MHz of spectrum (2490 – 2500 MHz) to be allocated for “other uses” the Commission deems to be in the public interest. There are numerous possibilities for the exploitation of

²⁷ Globalstar Comments at 7.

²⁸ Iridium Comments at 37. Modification of Licenses Held by Iridium Constellation, LLC and Iridium, US LP for a Mobile Satellite System in the 1.6 GHz Frequency Band, *Order*, DA 03-1917 (rel. June 11, 2003) (“*June 11 Order*”).

this “reclaimed” spectrum. In response to the *NPRM*’s request for proposals on the possibility of making any returned spectrum available in a second Big LEO processing round,²⁹ several commenters suggested that such spectrum should be put to use for certain new services. Proposals varied from replacing Globalstar in the 2490-2500 MHz band with MDS/ITFS operators,³⁰ to re-tasking the 2489.5 – 2492.5 MHz and 2498 – 2500 MHz bands for use by unlicensed wireless network devices,³¹ and to making most of the Big LEO CDMA service bands available to the federal government to support military MSS use.³²

Given the diverse nature of the proposals there will be a need for considerable investigation of the alternatives. In order to avoid delaying the pressing core issues in this proceeding, the Commission should examine options for the reclaimed spectrum in a further notice of proposed rulemaking. This would ensure a timely rebalancing of the spectrum resources between the competing Big LEO licensees and a prompt response to Iridium’s pressing needs for additional spectrum.

Iridium is generally neutral towards the various proposed uses of reclaimed spectrum at this time. However, Iridium does not support any proposal that attempts to introduce a third service into the status quo unless the future proceeding is premised on

²⁹ *NPRM* ¶ 271.

³⁰ Comments of Verizon Wireless, IB Docket No. 02-364, at 4-8 (filed July 7, 2003).

³¹ See Comments of IEEE 802, IB Docket No. 02-364 (filed July 7, 2003); Comments of License-Exempt Alliance, IB Docket No. 02-364 (filed July 7, 2003). Also, the American Petroleum Institute & United Telecom Council proposed allocating the 2.4 GHz band to IP delivery systems. See Comments of American Petroleum Institute and United Telecom Council, IB Docket No. 02-364, at 5-6 (filed July 7, 2003).

³² See Comments of National Telecommunications and Information Administration, IB Docket No. 02-364 (filed July 15, 2003).

an allocation of spectrum that results in Iridium's exclusive access to 10.5 MHz of spectrum in the 1.6 GHz frequency band.

Also, Iridium notes that the National Telecommunications and Information Administration's ("NTIA") proposal, recommending that most of the Big LEO spectrum be reallocated to the U.S. Government for military MSS uses, ignores the fact that the government already has sufficient non-commercial spectrum over which the military may provide its own satellite communications. In addition, the Big LEO bands are already occupied by two MSS systems, which collectively require access to the full amount of 1.6 GHz spectrum for their survival.

Finally, NTIA's proposal does not appear to take into full consideration the fact that the Department of Defense ("DOD") already uses the Iridium system and that, with certain enhancements already made to the Iridium system, satisfies the DOD's Global Secure MSS communications requirements. This use of the Iridium system allows DOD's critical requirements to be met immediately, rather than requiring DOD to design, construct, launch, and deploy a future system. From the outset of its contract with Iridium, the DOD has had immediate, global communications that it could use instantly in any areas of conflict, including those without any local infrastructure, such as Afghanistan and Iraq. For example, U.S. and Coalition forces were able immediately to use and continue to utilize Iridium's commercial network with great success in the Middle East region.

Similarly, Iridium disagrees with the comments of Lockheed Martin Corporation ("Lockheed Martin") to the extent that those comments support allocation for federal

government use of a portion of the Big LEO band³³ and/or retention of the original Big LEO spectrum-sharing plan.³⁴ The sole justification proffered by Lockheed Martin for preserving the band is that new CDMA systems can share Globalstar's spectrum.³⁵ Other than a federal government system that Lockheed Martin hopes to construct, however, Lockheed Martin points to no expression of interest by any new or prospective CDMA operator—not even itself. Moreover, a minimum of three new CDMA systems would be required to support perpetuation of a spectrum allocation designed for sharing among five satellite system operators. Thus, Lockheed Martin provides no reason for the Commission to decline to rebalance the outdated band plan.

B. The Balanced Band Plan Achieves The Goal of Sound Spectrum Management Serving The Public Interest

Iridium's proposed band plan reflects sound spectrum management principles and serves the public interest. One of the key principles of a sound spectrum management is the promotion of a pro-competitive spectrum framework in which all service providers can operate on a level playing field. In the Big LEO service, the Commission has made parity among the service operators the basis upon which to build that pro-competitive framework. However, the current band plan is now inherently imbalanced.

Unexpectedly free from CDMA-based MSS competitors, Globalstar now has access to 27.85 MHz of frequency-separated, paired spectrum. Iridium, in contrast, has access to less than one-fifth the amount of spectrum available to its only Big LEO competitor.

³³ Comments of Lockheed Martin Corporation, IB Docket No. 02-364, at 2-3 (filed July 11, 2003) (“Lockheed Martin Comments”).

³⁴ *Id.* at 4-5.

³⁵ *Id.*

As the Commission has recognized, the current Big LEO spectrum allocation results from an obsolete plan for the sharing of spectrum among five Big LEO licensees.³⁶ The *NPRM* clearly relates that the original plan called for four CDMA systems to share 11.35 MHz of service uplink spectrum in the 1610-1621.35 MHz band and 16.5 MHz of service downlink spectrum in the 2483.5-2500 MHz band, for a total of 27.85 MHz, and one TDMA system to have exclusive use of 5.15 MHz in the 1610-1621.35 MHz band. Globalstar and three other CDMA licensees comprised the four CDMA licensees. Iridium's grant of 5.15 MHz of spectrum was intended to be roughly proportionate to the spectrum authorized to its competitors.

Now, nearly a decade later, there is only one CDMA Big LEO system, the Globalstar system, operating in over 27.85 MHz of spectrum, and one TDMA Big LEO system, the Iridium system, operating in just 5.15 MHz of spectrum.³⁷ It is time to balance the band and restore the principle of parity to the Commission's management of the Big LEO service so the Big LEO licensees can compete on equal footing.

The competitive advantages of the status quo for Globalstar are obvious and established throughout the record. Iridium's comments detail that with 27.85 MHz of

³⁶ See *NPRM* ¶ 262-63; Letter from Richard E. Wiley, Counsel to Iridium Satellite, LLC to Marlene H. Dortch, Secretary, FCC, 1 (Dec. 3, 2002). See also Amendment of the Commission's Rules To Establish Rules and Policies Pertaining To A Mobile Satellite Service In The 1610-1626.5/2483.5-2500 MHz Frequency Bands, *Report and Order*, 9 FCC Rcd 5936, 5954-59 (1994) ("*Big LEO Order*"); *on reconsideration*, *Memorandum Opinion and Order*, 11 FCC Rcd 12861 (1996).

³⁷ The remaining three CDMA Big LEO licensees have either given back or lost their licenses. See *Mobile Communications Holdings, Inc.*, 16 FCC Rcd 11766 (2001), *petition for reconsideration denied*, *Mobile Communications Holdings, Inc.*, 17 FCC Rcd 11898 (2002), *app. for review pending*; *Constellation Communications Holdings, Inc.*, 17 FCC Rcd 22584 (2002), *petition for reconsideration pending*; Satellite Policy Branch Information Satellite Applications Accepted for Filing, *Public Notice*, Report No. SPB-114, at 2 (Jan. 15, 1998) (noting TRW Inc.'s notice to the Commission that it would no longer pursue its Odyssey system and that the authorization could be cancelled).

operational spectrum, Globalstar has been free to offer full rate voice and data services, while spectrum limitations have forced Iridium to cut voice and data rates in half throughout its network.³⁸ This reduction has degraded the voice quality for subscribers and slowed the data rates at which a customer can send and access data. In addition, despite the above-mentioned efforts to make the Iridium system as spectrally efficient as possible, the 5.15 MHz of spectrum currently assigned to Iridium is insufficient to meet current and projected demand or support the type of service enhancements and introduction of new services necessary to remain competitive in the MSS marketplace.

Under these circumstances, a rebalancing of the Big LEO spectrum band is timely, critical, and in the public interest. In light of the events of the past nine years, the Commission must equitably redistribute spectrum between the Big LEO licensees to comport with its initial intention to have spectral parity among the Big LEO licensees. The proposed band plan will provide Iridium the parity and, in turn, allow Iridium to introduce the innovations that will force Globalstar to introduce similar innovations, improving the overall level of satellite services available to the public while also lowering their price. Without a redistribution giving Iridium a proportionate amount of spectrum, Iridium will be unable to meet the needs of MSS customers today and into the future.

Iridium's proposed band plan also will achieve probably the most important goal of spectrum management—fostering efficient use of the spectrum. By more fairly dividing the Big LEO spectrum between the remaining Big LEO licensees, the band plan matches spectrum allocations in the band with the actual, real-world spectrum needs of

³⁸ Iridium Comments at 28-30.

the licensees. As shown above, the band plan will provide Iridium with the spectrum it needs to meet the growing demand for its services, improve existing services (e.g., reactivate full rate data and voice modes), and introduce new services like ATC. At the same time, the band plan places Globalstar on equal footing with Iridium in terms of spectrum capacity.

II. GLOBALSTAR’S OPPOSITION TO A REBALANCED BIG LEO SPECTRUM BAND PLAN IS BASED UPON SELF-SERVING CLAIMS THAT MISSTATE THE FACTS, THE LAW AND THE PUBLIC INTEREST

In its initial comments, Globalstar attempts to justify preservation of the status quo without regard to the reality of technology and the MSS market. In addition, Globalstar’s comments are inherently flawed in several material respects. Finally, through its procedural claims concerning Sections 312 and 316 of the Communications Act, Globalstar attempts to elevate its authority to access spectrum on a shared basis into an exclusive license in perpetuity.

A. Globalstar’s Comments Are a Reverse-Engineered Attempt to Rationalize Preserving The Status Quo Without Regard to Today’s Reality

Globalstar’s position can best be described as a post-hoc rationalization for an unintended, out-dated, inequitable, and anti-competitive band plan outcome. Globalstar attempts to validate its exclusive use of all of the nearly 28 MHz of spectrum originally allocated on a shared basis to four CDMA licensees. Globalstar claims that its system requires access to all nine channels at L-band for uplink and all thirteen channels at S-band for downlink to support all of Globalstar’s current services and ATC.³⁹ Although Globalstar offers “technical” system requirements for its current and potential (ATC)

³⁹ Globalstar Comments at 6-8.

services, it does not provide the technical data to support its claims for needing 27.85 MHz of spectrum.

Rather, Globalstar appears to begin with the assumption that it must show the Commission that it is utilizing all nine uplink channels, and then carefully segments its use between several types of services to justify its claims. For example, as discussed in more detail in Section III.B.2 below, Globalstar claims that it must have one channel set aside exclusively for ATC, four channels for regular voice and data services, two channels for aviation services, and two channels for remote telemetry. Clearly, given the ever-growing trend for convergence of communications due to packet-based networking, any segmentation of services is an ineffective, outdated approach that must not be countenanced by the Commission. Moreover, as noted above, it is inconsistent with Globalstar's and Globalstar Canada's descriptions of the availability and use of spectrum by the Globalstar system in different regions.

B. Globalstar's Comments Are Inherently Flawed in Material Respects

Even more surprising is Globalstar's implicit request throughout its comments that the Commission apply a double standard in this proceeding—one standard for Globalstar and another for Iridium. This approach results in inconsistencies and untenable claims strewn throughout Globalstar's comments. As described in more detail below, the various positions Globalstar takes in its comments are contradictory and flawed in a number of material respects.

1. Globalstar Proposes a Double Standard Under Which Iridium Must Show Need For Spectrum, But Globalstar is Under No Such Obligation

Globalstar mistakenly and misleadingly asserts that “[b]efore the Commission can consider allowing Iridium access to any additional Big LEO spectrum, it must find on the

record that Iridium is using its assigned spectrum fully and efficiently.”⁴⁰ There is absolutely no support for this characterization of what the Commission can and should do in this proceeding. In fact, the reference to the Big LEO Rules Order upon which Globalstar bases this claim is not to the Commission’s discussion of “Reduction in Spectrum for Single CDMA System”⁴¹ – the scenario at issue here – but to the section considering “Other Potential Scenarios.”⁴² Specifically, in the text upon which Globalstar relies, the Commission is considering the “course of action to be taken in the event that only one Big LEO system is implemented, whether it is a CDMA or TDMA/FDMA system.”⁴³ That is, of course, not the situation in the instant proceeding.

Globalstar then goes on to assert that Iridium is not using its current allocation of 5.15 MHz efficiently and attempts to demonstrate that Iridium has no need of additional spectrum.⁴⁴ As is very clear in its comments in this proceeding, Iridium has a definite, urgent need for additional spectrum. Moreover, nowhere does Globalstar accede that its own needs should pass the tests by which it proposes to measure Iridium.

2. Globalstar Asserts That Iridium Cannot Show The Need For More Than Its Existing 5.15 MHz Allocation, But Globalstar Claims That It Requires Continued Access To Close to 28 MHz of Spectrum

Globalstar asserts that Iridium cannot show that it needs more than its existing 5.15 MHz allocation, but at the same time Globalstar states that its own system requires

⁴⁰ *Id.* at 12-13 (citing *Big LEO Rules Order*, 9 FCC Rcd at 5961).

⁴¹ *Big LEO Rules Order*, 9 FCC Rcd at 5959-60.

⁴² *Id.* at 5960-61.

⁴³ *Id.* at 5961.

⁴⁴ Globalstar Comments at 13-15.

continued access to close to 28 MHz of spectrum. Not only is this position unworkable, it is also belied by the comments of Globalstar Canada, wherein it appears that approximately 20% of Globalstar users are served by only 3.75 MHz of uplink spectrum.⁴⁵

Globalstar's efforts to justify its continued exclusive use of 27.85 MHz of spectrum are premised upon a simplistic and inefficient spectrum approach. For example, Globalstar asserts that two channels (comprising a full 5 MHz of spectrum, which is roughly equivalent to Iridium's entire current allocation) are necessary exclusively for aviation service and another two channels must be set aside exclusively for simplex telemetry.⁴⁶ Moreover, according to Globalstar, there can be no overlap in channel use by ATC, aviation service, remote telemetry, or generic voice and data services.⁴⁷

In contrast, the Iridium system can use the same channels for any of its services, including voice, data, simplex paging, and short burst messaging. In addition, Iridium offers equipment and services for remote monitoring, telemetry, and signaling on a global basis. These devices operate at very low power and utilize the same channels as all of the other Iridium services. How Globalstar can continue to maintain that its system is more spectrally efficient than the Iridium system is simply amazing.

⁴⁵ Globalstar Canada Comments at 2.

⁴⁶ Globalstar Comments at 7, 8.

⁴⁷ *Id.* at 8.

3. Globalstar Claims That The Iridium System is Inefficient But That The Globalstar System is Efficient, Despite The Fact That The Iridium System is Handling a Far Greater Level of Traffic With Access to Less Than One Fifth The Spectrum

Under the existing allocation, Iridium is squeezing capacity out of its MSS spectrum allocation on an unpaired basis, while Globalstar is employing an anachronistic and inefficient approach of dedicated channels for discrete types of service offerings that allows it to spread its operations out over five times the amount of spectrum used by the Iridium system. Further compounding Globalstar's spectrum inefficiency, it has artificially and wastefully segregated channels between Globalstar gateways, thereby allowing significant portions of spectrum to lie fallow over large geographic regions. Even so, Globalstar asserts that Iridium's system design is inefficient but maintains that Globalstar's own system design is efficient. The numbers just do not support Globalstar's claims. Indeed, Iridium's customer base uses significantly more minutes of use—more than 1 ½ times the amount in the first half of 2003—than the minutes of use reported by Globalstar.

Globalstar reports that its system handled almost 2.5 million minutes of use in the United States (including the Caribbean) in the second quarter of 2003.⁴⁸ Two and a half million minutes of use is equal to 89,766 minutes per MHz of the entire 27.85 MHz to which Globalstar has access. To compare the spectral efficiency of the two systems, over this same period of time Iridium carried over 28 million minutes of use in the Middle East region. Iridium supported this traffic on an average of 6.87 MHz, which correlates to 4,074,883 minutes per MHz of spectrum. In this comparison, the Iridium system's use of spectrum is over 4,500 % more efficient than that of Globalstar.

⁴⁸ *Id.* at Attachment A.

In a straightforward “apples-to-apples” comparison of the two systems, the Globalstar system is far less spectrally efficient than the Iridium system. For example, in April of 2003, Globalstar stated that it was supporting approximately 1.2 million minutes of use per month in the region “from Italy to Afghanistan and from Russia to the Arabian Sea.”⁴⁹ Globalstar also stated that it was currently utilizing 15 MHz of spectrum, but that, with the imminent addition of an additional channel to meet demand, it would be using a total of 17.5 MHz of spectrum for the region described above.⁵⁰ Using 15 MHz of spectrum, the spectrum efficiency of the Globalstar system was only 80,000 minutes per MHz of spectrum for the entire month. Yet apparently this system loading necessitated adding an additional channel to meet demand. With the additional channel, the resulting spectral efficiency was only 68,571 minutes per MHz for that month. For that same period, Iridium supported a spectral usage of 1,464,038 minutes per MHz within a small subset of the region described by Globalstar above. Hence, Iridium is using MSS spectrum 21 times more efficiently than Globalstar in the same region.

Based on its own speculative calculation derived from “monitor[ing] the impact of Iridium transmissions” on Globalstar’s service, Globalstar asserts that Iridium is using 11% of its available capacity.⁵¹ Both the methodology and the results of this approximation are ludicrous. Using specific data from its current operations, Iridium has demonstrated that its system is very efficient in its use of spectrum. In its May 8, 2003

⁴⁹ Letter from William F. Adler, Globalstar, L.P. to Thomas S. Tycz, Chief, Satellite Division, FCC, 2 (April 11, 2003).

⁵⁰ *Id.* (noting Globalstar’s use of five gateways covering six channels (channels 1, 2, 6, 7, 8 and 9) each with 2.5 MHz of combined up and downlink spectrum and stating Globalstar’s intent to add one more 2.5 MHz channel (channel 5) to one of the gateways).

⁵¹ Globalstar Comments at 13 n.16.

response to Globalstar's opposition to Iridium's STA request, Iridium illustrated through specific calculations that its average use of available spectrum is 64.18%—significantly higher than the 9% estimated by Globalstar then and the 11% Globalstar posits now.⁵²

Incredibly, in maintaining that Iridium is not using its existing spectrum allocation efficiently, Globalstar boldly asserts that 5.15 MHz alone should be sufficient “to serve more than half a million subscribers in the Continental United States.”⁵³ But elsewhere in its filing Globalstar states that it had less than 25,000 subscribers in the United States (including the Caribbean) as of the end of 2Q03,⁵⁴ with access to nearly 28 MHz of spectrum. Based on its own representations, Globalstar's claims that it “is using fully and efficiently the 11.35 MHz of L-band and 16.5 MHz of S-band assigned ...”⁵⁵ must be examined closely by the Commission.

The Commission should also examine how Globalstar can be fully using the nearly 28 MHz of spectrum when it has not completed construction of its system and when some of the most populous and underdeveloped areas of the world cannot technically receive coverage.⁵⁶ The Gateway Segment of the Globalstar system has never been completed. As a result, one continent (Africa), one densely populated sub-continent (the Indian sub-continent), and the countries of Southeast Asia are incapable of being

⁵² See Letter from Peter D. Shields, Counsel to Iridium Constellation LLC to Thomas S. Tycz, Chief, Satellite Division, FCC (May 8, 2003).

⁵³ Globalstar Comments at 13.

⁵⁴ *Id.* at Attachment A.

⁵⁵ *Id.* at 3.

⁵⁶ See Globalstar coverage map, available at http://www.globalstar.com/view_page.jsp?page=coverage.

served by the Globalstar system. Thus the 27.85 MHz of spectrum to which Globalstar has access is not being used at all in some of the countries in which it is most needed.

4. Globalstar Argues That Iridium's 2 GHz Authorization is Relevant to This Proceeding, But Ignores The 2 GHz Spectrum of ICO, Its Proposed Future Owner

Globalstar would have the Commission consider Iridium's 2 GHz authorization in this proceeding, but apparently not the 2 GHz interests of ICO Global, Globalstar's putative future owner. Globalstar argues that the Commission should take into consideration the fact that Globalstar lost its 2 GHz license (for failure to meet construction milestones) when the Commission weighs the inequity of the current Big LEO band plan.⁵⁷ Globalstar also suggests that Iridium's future access to 2 GHz spectrum answers its need for additional spectrum for its existing services,⁵⁸ even though Iridium is not scheduled to operate in the 2 GHz band until July 2007—four years from now. The absurdity of this proposed double standard is obvious on its face.

Indeed, as the International Bureau has already explained for Globalstar's benefit, the Commission will not base its decision in this proceeding on spectrum interests in the 2 GHz band:

First, we do not agree that a Commission decision regarding whether to revise the Big LEO band plan must necessarily be affected by the amount of second generation spectrum available to GLP in the 2 GHz MSS band. We expect any decision the Commission may make regarding whether to revise the Big LEO band plan will be made based on the operations and use of systems in the Big LEO band. We do not believe that resolution of 2 GHz MSS licensing matters will have any bearing on whether or how

⁵⁷ Globalstar Comments at 29.

⁵⁸ *Id.* at 30.

the Commission may decide to alter the Big LEO band plan.⁵⁹

The International Bureau's analysis of the relevance of 2 GHz MSS interests in this proceeding is clearly correct.

Even if Globalstar's contentions concerning the attribution of 2 GHz MSS interests and their relevance in this proceeding had merit, however, the respective MSS interests of Globalstar and Iridium would still be unbalanced: Globalstar/ICO would have access to 27.85 MHz in the Big LEO band and 10 MHz or more in the 2 GHz band and Iridium would only have access to 5.15 MHz in the Big LEO band and 10 MHz or less in the 2 GHz band.

5. Globalstar Believes That Iridium's Ability to Provide ATC is Not Relevant, but Globalstar's ATC Needs Are

Despite the fact that Globalstar and Iridium are direct competitors, Globalstar asserts that Iridium's ability to provide ATC is not relevant to this proceeding, but that Globalstar's ATC needs corroborate Globalstar's claimed need to preserve the existing spectrum status quo. In its attempt to show that it is using all spectrum allocated to CDMA Big LEO systems, Globalstar relies heavily on its future plans to offer ATC: "Globalstar intends to assign at least one return link and one forward link channel for ATC in specific geographic (urban) areas."⁶⁰ Globalstar also contends that Iridium initiated this rulemaking to obtain additional spectrum so that it could provide ATC, like Globalstar.⁶¹

⁵⁹ Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands, *Order*, DA 03-2229, ¶ 7 (rel. July 9, 2003).

⁶⁰ Globalstar Comments at 8.

⁶¹ *Id.* at 15.

In contrast, Globalstar contends, because Iridium cannot provide ATC in the L-band, “Iridium’s ATC issues cannot be a basis for a decision modifying the Big LEO band plan.”⁶² Globalstar’s disjointed approach to ATC shows that it has missed the point of this proceeding. The Commission initiated this proceeding to re-examine the Big LEO spectrum sharing plan based on circumstances as they exist today.⁶³ Unlike Globalstar, Iridium does not base its spectrum needs showing on the speculation that it might offer ancillary services in the future. Demand for Iridium’s existing, primary MSS service offerings and the need to remedy an unintended and inequitable spectrum framework is what requires a rebalancing of the Big LEO bands.

C. Globalstar’s Claim of Right to a Hearing Misstates The Law

Globalstar also contends that the Commission may not reallocate spectrum in the Big LEO band except as provided by Section 316 of the Communications Act. That section requires that, before the Commission modifies the terms of a particular license, it must give the license holder written notice of the proposed modification and an opportunity to protest the proposed modification.⁶⁴ In certain circumstances, a hearing also may be required.⁶⁵ As demonstrated below, Globalstar misstates the law—Section 316 does not apply to the instant proceeding.⁶⁶

⁶² *Id.*

⁶³ *NPRM* ¶ 265.

⁶⁴ 47 U.S.C. § 316(a)(1).

⁶⁵ *Id.* § 316(b).

⁶⁶ Globalstar also cites Section 312 of the Communications Act, *see* Globalstar Comments at 32 n. 62, but that provision has no possible applicability here. That section governs sanctions issued by the Commission against licensees for violations of the Act or its rules. *See* 47 U.S.C. § 312 (entitled “Administrative sanctions”). There has been no

Clearly, Globalstar never had – and does not now have – an unconditional right to operate in perpetuity in the existing CDMA spectrum. Quite the contrary, the Commission order establishing the current Big LEO band plan expressly stated in the section of the order titled “Conditions to the Plan,” that, in the event that only one CDMA licensee came into existence, the Commission would consider how to reallocate the relevant spectrum “in the context of a rulemaking, based upon the circumstances that have developed at that time.”⁶⁷ Indeed, it was a specific “condition[] to the plan” that there would be a “[r]eduction in [s]pectrum” in the event of a “[s]ingle CDMA [s]ystem.”⁶⁸ The Report and Order made perfectly clear that “bandwidth adjustment” would occur if, as it transpired, “only one CDMA system is licensed.”⁶⁹ The terms of Globalstar’s original license reflects this basic condition. That license explicitly provides that “the *temporary assignment* of . . . any particular frequencies . . . is subject to change by summary order of the Commission on 30 days’ notice *and does not confer any permanent right to use the ... spectrum.*”⁷⁰ Because Globalstar possesses no unconditional right to use this spectrum, any reallocation of its spectrum is not a “modification” of its license subject to Section 316.⁷¹

suggestion in this proceeding that the Commission intends to sanction Globalstar for unlawful conduct by revoking a license.

⁶⁷ 9 FCC Rcd at 5960.

⁶⁸ *Id.* at 5959-60.

⁶⁹ *Id.* at 5963 n.65.

⁷⁰ *In re Application of Loral/Qualcomm Partnership, L.P., For Authority to Construct, Launch, and Operate Globalstar, a Low Earth Orbit Satellite System to Provide Mobile Satellite Services in the 1610-1626.5 MHz/2483.5-2500 MHz Bands*, DA 95-128 (Jan. 31 1995), ¶32 (emphasis added).

⁷¹ See *AMSC Corp. v. FCC*, 216 F.3d 1154, (D.C. Cir. 2000) (“[W]e regard ‘a license [as] modified for purposes of section 316 when an *unconditional right* conferred by the

Moreover, a generally applicable spectrum reallocation plan adopted in a valid rulemaking proceeding does not constitute a “modification” of a particular license subject to the requirements of Section 316. Rather, as the actual holding of the very (and only) case cited by Globalstar makes plain, “the FCC need not engage in evidentiary hearings required for modification of a particular license . . . ‘when . . . a new policy is based upon the general characteristics of an industry.’”⁷² This is so because, “‘rational decision is not furthered by requiring the agency to lose itself in an excursion into detail that too often obscures fundamental issues rather than clarifies them.’”⁷³ Here, the spectrum reallocation proposed by the Commission in its *NPRM* would apply generally to all licensees who seek to operate in the Big LEO band, not just Globalstar, and is based on policy considerations regarding the most efficient use of finite spectrum. Section 316, therefore, does not operate here to “deprive the Commission of its authority to pursue a rulemaking ‘necessary for the orderly conduct of its business.’”⁷⁴

Finally, as a practical matter, Globalstar cannot plausibly claim that it did not receive notice that the spectrum would be reallocated if only one CDMA licensee materialized or that it has not had an opportunity to make its objections to such action known.⁷⁵ There can be no credible suggestion that Globalstar has not been afforded

license is substantially affected.’”) (quoting *P&R Temmer v. FCC*, 743 F.2d 918, 927-28 (D.C. Cir. 1984)) (emphasis added).

⁷² *Committee for Effective Cellular Rules v. FCC*, 53 F.3d 1309, 1319 (D.C. Cir. 1995) (quoting *WBEN, Inc. v. United States*, 396 F.2d 601, 617-18 (2nd Cir. 1968)).

⁷³ *Id.*

⁷⁴ *Id.* at 1320 (quoting *United States v. Storer Broadcasting*, 351 U.S. 192, 202-03 (1956)).

⁷⁵ *Cf. California Citizens Band Ass’n v. United States*, 375 F.2d 43, 50 (1967) (rejecting petitioner’s claim that rulemaking changing available frequencies was subject to Section

notice and an opportunity to be heard– the basics of the procedural due process guaranteed by Section 316 – on the question of spectrum reallocation in the Big LEO band.

III. THE BALANCED BAND PLAN PROPOSED BY IRIDIUM IS CONSISTENT WITH ENSURING INTERFERENCE PROTECTION TO OTHER USERS AND SERVICES

Iridium has consistently demonstrated through (1) its interference-free operations under its ongoing special temporary authority and (2) meeting the requirements of the Memoranda of Understanding (MoUs) it has followed to protect the Radio Astronomy Service (RAS), that it will consistently protect the adjacent channel licensee operations in the Big LEO band. Iridium will continue to protect global navigation operations with the Commission’s adoption of Iridium’s proposed band plan. Contrary to Globalstar’s allegations of increased interference potential from licensees in the 2.4 GHz band, Iridium does not believe that its proposed band plan will adversely affect any ongoing MSS operations. Finally, as stated in its comments, Iridium is committed to utilizing a guard band between its operations and Globalstar’s in the Big LEO band and also meeting the out-of-band (OOB) emission mask requirements of the Commission’s rules. The proposed Iridium band plan will therefore not introduce any added interference into the Big LEO band, or to adjacent channel operations.

316 and noting that “[f]or all practical purposes [the notice of proposed rulemaking] provided petitioner with an opportunity to show cause why the rule changes should not be made,” that “Petitioner was aware of this notice,” and that “petitioner filed a seventeen-page comment with the Commission”); *Transcontinent Television Corp. v. FCC*, 308 F.2d 339, 343 (D.C. Cir. 1962) (rejecting petitioner’s claim that channel allocation effectuated in rule making was subject to Section 316 and observing that petitioner “was heard, though in accordance with rule making procedures”).

A. The Balanced Band Plan Protects Radio Astronomy

In its comments, Cornell University (“Cornell”) expresses concern that Iridium operations in the frequencies proposed for reassignment in Iridium’s proposed band plan (1615.35 – 1626.5 MHz) present “the possibility of additional harmful interference” to the RAS bands (1610.6-1613.8 MHz).⁷⁶ However, in expressing its concern over Iridium’s plan, Cornell fails to provide any technical showing that such interference would or could occur. Indeed, it acknowledges that it is still examining whether any actual interference would occur.⁷⁷

As Iridium noted in its comments, Iridium has strictly respected the protection from interference rights of the RAS and the need to ensure the success of the scientific data gathering efforts of these entities, and it will continue to do so under its proposed band plan. Notably, Iridium will continue to comply with the MoUs with the RAS. Moreover, the additional spectrum made available to Iridium in its proposed Big LEO spectrum-sharing plan would enable more effective use of the channel crowding functionality useful to protect RAS.⁷⁸ As described in Iridium’s comments, assignment of additional Big LEO channels to Iridium will enable Iridium to implement more efficiently the bandwidth compression functionality currently supported by the Iridium system.⁷⁹ This functionality ensures that, when necessary, the space-to-ground beams impinging on radio astronomy sites can be operated at the upper end of the MSS Big LEO allocation, thereby providing for significantly reduced OOB emissions.

⁷⁶ Comments of Cornell University, IB Docket No. 02-364, at 1 (filed July 14, 2003).

⁷⁷ *Id.* at 5-6.

⁷⁸ Iridium Comments at 37-38.

⁷⁹ *Id.* at 38-39.

Furthermore, Iridium has operated (and continues to operate) its broadcast control channels at reduced power levels in order to further reduce its OOB emission levels in the 1610.6-1613.8 MHz band on a continuous 24 hours per day, 7 days per week basis. Cornell can thus be assured that the critical research conducted in the RAS band will remain undisturbed.

B. The Balanced Band Plan Protects The Global Navigation System

Until 1998, the GLONASS system, the global positioning system used by Russia, operated in spectrum up to the 1615.5 MHz. At the time of Globalstar's original authorization in Russia, Globalstar sought to operate its system beginning at only 1616 MHz to avoid interference with GLONASS. In the following years, GLONASS gradually shifted its operations from 1615.5 MHz to 1609.3 MHz. In fact, GLONASS, by 2005, will shift its operation to 1605.375 MHz. In spite of these operational shifts, as recently as April 2002, Globalstar indicated that it had not yet sought to revise its operations to reflect the GLONASS frequency reduction, but planned to do so in the near future.⁸⁰

Once GLONASS shifts its operations to 1605.375 MHz as planned and Globalstar amends its operations in accordance with this shift, the balanced band plan proposed by Iridium will enable Iridium to obtain additional spectrum for its customer needs while protecting the GLONASS system from interference. Globalstar could also protect GLONASS through better OOB filtering on its mobile terminals. Iridium does not believe that the balanced band plan, with appropriate engineering of OOB emissions in

⁸⁰ Globalstar orally stated that it planned to seek access to additional spectrum in the lower portion of the 1.6 GHz band from the Russian government during a telephone conference among representatives from Globalstar, Iridium, the FCC and the NTIA on April 11, 2003.

accordance with the Commission's rules, will lead to any increase in the interference potential to GLONASS.

C. The Balanced Band Plan Does Not Adversely Affect ISM Interference Issues

Globalstar claims that it requires access to additional 2.4 GHz spectrum because, among other dubious reasons, the interference effects from industrial, scientific and medical (ISM) devices can only be mitigated by the "maximum amount of S-band" spectrum.⁸¹ Globalstar also indicates that ISM emission levels are higher in urban areas where such equipment is more prevalent.⁸²

The issue of ISM interference in the 2.4 GHz band is not governed by the amount of spectrum available. Rather, it is driven by the energy transmitted by ISM devices in the 2.4 GHz band and the general proximity of MSS mobiles to such equipment. As even Globalstar acknowledges, the vast majority of ISM operations are indoors, which shields their energy from interfering with MSS mobiles.⁸³ In addition to this shielding, the duty cycles of these devices are so short that the probability of an ISM device operating in close proximity to an MSS mobile and at the same time as a MSS mobile is extraordinarily unlikely.⁸⁴ If Globalstar successfully deploys ATC base stations in urban areas of need, the greatly enhanced signal strength of the ATC base stations should

⁸¹ Globalstar Comments at 12.

⁸² *Id.*

⁸³ *Id.*

⁸⁴ For example, a microwave oven in an urban environment might be used, on average, for several minutes per day, and potentially not always at full power. In contrast, a cellular base station operates nearly continuously throughout the day.

further ensure that the desired signal (the signal of the ATC base station) received at the MSS mobile is greater than the undesired signal (the signal of the ISM device).

With this understanding of the 2.4 GHz band, and without any technical detail whatsoever provided by Globalstar for analysis, Globalstar's questionable assertions of the need for the "maximum amount" of 2.4 GHz spectrum for interference protection must be rejected by the Commission. ISM operations are unlikely to adversely affect any MSS operations, especially in light of the ATC authority recently granted to MSS licensees.

D. The Balanced Band Plan Ensures Non-Interference Between Big LEO Licensees

In its comments, Iridium noted that the use of a guard band of 0.65 MHz, in addition to compliance with Big LEO OOB emission requirements, would ensure that both Iridium and Globalstar systems can operate without the potential for harmful interference.⁸⁵ Such a precautionary measure is supported by the Commission's long-established policy that spectrum guard bands, where necessary to ensure interference-free operations, are in the public interest.⁸⁶

Iridium's recent operation under STA authority has demonstrated that its use of additional Big LEO spectrum does not adversely affect the ongoing operations of Globalstar. To the contrary, as the Commission has recognized, Globalstar has been unable to demonstrate any interference problems from Iridium's use of 2.5 MHz of

⁸⁵ Iridium Comments at 35-36.

⁸⁶ See Service Rules for the 746-764 and 776-794 MHz Bands and Revisions to Part 27 of the Commission's Rules, 15 FCC Rcd 476, 491-92 (2000); *NPRM* ¶ 204.

spectrum in the Big LEO band.⁸⁷ Iridium believes that this real-world practical experience shows that its use of additional spectrum will not undermine any of Globalstar's operations but will simply correct the major imbalance of spectrum between the two Big LEO competitors. As part of this modified band plan, Iridium will continue to comply with the same OOB emission limitations that are currently in place and, to eliminate even the remote chance that harmful interference could occur, has suggested the introduction of a spectrum guard band between Iridium and Globalstar operations. However, Iridium's recent experience suggests that even the .65 MHz suggested in its comments may be greater than necessary. Iridium suggests that the size of the guard band could be determined between Iridium and Globalstar. With these measures in place, the Commission can be assured, as it found in the technical appendix to the *NPRM*,⁸⁸ that Iridium's proposed spectrum plan for Big LEO licensees will not cause interference between Globalstar's and Iridium's adjacent channel operations.

⁸⁷ See *June 11 Order* ¶ 8.

⁸⁸ *NPRM*, Appendix C, Section 3.1, at 240-41.

IV. CONCLUSION

As the Commission has recognized and as Iridium has demonstrated in this proceeding, there is a compelling and pressing need for the Commission to act rapidly to replace the current unintended and inequitable Big LEO MSS band plan. A new band plan is necessary to ensure that both Big LEO system operators have adequate spectrum to meet the demand for their services, enhance their existing services, and introduce the new and innovative services essential to remaining competitive. Such a plan is essential to forming a pro-competitive framework for the future. Iridium's proposed band plan is the only proposal in this proceeding that provides comparable spectrum on a non-interfering basis to both Iridium and Globalstar. For the foregoing reasons, the Commission should promptly adopt Iridium's proposal for a rebalancing of the Big LEO band.

Respectfully submitted,

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