

REDACTED – FOR PUBLIC INSPECTION

October 20, 2014

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VIA ECFS

Marlene H. Dortch, Secretary  
Federal Communications Commission  
445 12th St., S.W. - The Portals  
Washington, D.C. 20554

Re: Presentation of Iridium Constellation LLC, RM-11697, IB Docket No. 13-213, and RM-11685

Dear Ms. Dortch:

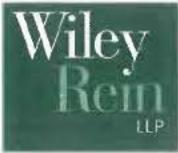
Iridium Constellation LLC (“Iridium”) herewith submits a presentation in the above-referenced docket. Enclosed, please find the redacted for public inspection version of the presentation, entitled *Iridium’s Spectrum Petition, October 2, 2014*.<sup>1</sup>

Pursuant to the procedures set forth in the Joint Protective Order<sup>2</sup> adopted in these proceedings, one copy of the presentation in redacted form is being filed through the Federal Communications Commission’s Electronic Filing Comment System (“ECFS”). In addition, one copy of the “Confidential” version and one copy of the “Highly Confidential” version are being delivered to the Office of the Secretary, and two copies of each are being delivered to Lynne Montgomery of the International Bureau’s Satellite Division.

Should any questions arise concerning this filing, please do not hesitate to contact the undersigned counsel for Iridium.

<sup>1</sup> The presentation was previously submitted on October 6, 2014 with a request for confidential treatment.

<sup>2</sup> *In the Matter of Iridium Constellation LLC Petition for Rulemaking to Promote Expanded Mobile Satellite Service in the Big LEO MSS-band, and 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*, Joint Protective Order, RM-11697, IB Docket No. 13-213, and RM-11685, DA 14-1500 (rel. Oct. 16, 2014).



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Best regards,

A handwritten signature in black ink that reads "Nancy J. Victory". The signature is written in a cursive style with a large, looping initial "N".

Nancy J. Victory

Attachment



# Iridium's Spectrum Petition October 2, 2014



RELIABLE • CRITICAL • LIFELINES

# Outline

1. Significant Changes Have Occurred Since 2007 That Require Revisiting the Big LEO Band Plan
2. Iridium's Spectrum Petition Timeline
3. Iridium's Original Proposal Based on its Growing Spectrum Needs
4. Iridium's Revised Proposal Resolves Globalstar's Claimed Harms
5. Iridium's Revised Proposal Answers All Other Globalstar Arguments
6. The Facts in the Record Support Grant of Iridium's Request On the Merits
7. Conclusion

## KEY

“[BCI]” - Begin Confidential Information

“[BHCI]” - Begin Highly Confidential Information

“[ECI]” - End Confidential Information

“[EHCI]” - End Highly Confidential Information



# Significant Changes Have Occurred Since 2007 That Require Revisiting the Big LEO Band Plan

## 2007 Big LEO Band Plan

- Set in 2007 *Order on Reconsideration*
  - Globalstar: 25.225 megahertz in 1.6 GHz and 2.4 GHz bands
  - Iridium total: 8.725 megahertz in 1.6 GHz band
  - This includes 0.95 megahertz shared between the operators

### Current Big LEO Band Plan



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# Iridium's Need for Spectrum is Driven by Growing Demand [BHCI] [REDACTED] [EHCI] Since 2007

- Use of Iridium's network continues to grow
  - Number of worldwide subscribers has more than tripled since 2007 (234,000 in Q4 2007 and 705,000 in Q2 2014)
  - Iridium has seen significant increases in voice and data usage - total channel usage on its satellites [BCI] [REDACTED] [REDACTED] [ECI]
- [BHCI] [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED] [EHCI]
- Iridium constantly explores options to do more with its spectrum and network resources
- FCC has issued STAs to accommodate spikes in Iridium traffic after every major natural or manmade disaster<sup>[1]</sup>

<sup>[1]</sup> See, e.g., SAT-STA-20050901-00171 (Hurricane Katrina); SAT-STA-20050923-00180 (Hurricane Rita); SAT-STA-20100115-00011 (earthquake in Haiti); SAT-STA-20110311-00052 (earthquake in Japan).

# Constellation Loading Analysis

• [BHCI]

[REDACTED]

[REDACTED]

[EHCI]



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# Constellation Loading Analysis

[BHCI]

[REDACTED]

[EHCI]

[BCI]

[ECI]

[BHCI]

[EHCI]

[BCI]

[ECI]

[BHCI]

[EHCI]

[REDACTED]

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iridium  
Everywhere

# Constellation Loading Analysis

[BHCI]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[EHCI]



iridium  
Everywhere



# Constellation Loading Analysis

[BHCI]

[REDACTED]

[REDACTED]



# Customer Demand [BHCI] [EHCI]

- Government and enterprise customers already request services [BHCI]

[REDACTED]

[REDACTED]

[REDACTED] [EHCI]

- Specific examples [BHCI]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] [EHCI]

# Demand for New Broadband Products Increase Iridium's Need for Spectrum

- U.S.G. investing in and modernizing its gateway facility to support new services
  - Recent \$12M gateway modernization project followed by five-year gateway services contract with potential value of \$38M
- Netted Iridium® beyond line-of-sight push-to-talk
- Iridium GO!™ personal Wi-Fi hot spot
- High Speed data for maritime, aviation, and remote locations
- Fastest growing supplier of low data-rate satellite M2M/Internet of Things



# Iridium NEXT Positions Iridium for the Future

Fully funded approximately \$3 billion plan that supports our continued growth through at least 2030

- Deployment scheduled between 2015 and 2017 using SpaceX Falcon 9 rockets as primary launch vehicles
- Retains LEO architecture with 66 new operational satellites, 6 in-orbit spares and 9 ground spares
- Compatible with existing network and devices
- Smooth network transition and customer continuity



## Globalstar's TLPS Proposal

- Globalstar seeks fundamental changes to the Big LEO MSS Band
  - Removal of basic rules to ensure MSS spectrum is used for MSS in the United States
  - Deployment of terrestrial Wi-Fi service across 22 megahertz of Globalstar's 2.4 GHz and annexed unlicensed spectrum that would create duplex MSS exclusion zones nationwide
  - Long-term introduction of LTE mobile operations to the 1.6 GHz band, risking harmful interference to numerous critical satellite services
- Iridium and Globalstar offer differing visions for the future of the Big LEO MSS band and their two proposals should be consolidated

## Globalstar's Pursuit of TLPS Precludes MSS and Impacts its Future Need for L Band Spectrum

- Globalstar acknowledged TLPS precludes duplex MSS<sup>[1]</sup>
  - Globalstar proposes TLPS deployment at public schools, hospitals, and other community facilities, followed by nationwide commercial build<sup>[2]</sup>
  - Globalstar's duplex MSS will only work where the people aren't
- TLPS places public safety users in contention with consumer communications during times of emergency
  - Globalstar says that free MSS will be provided during emergencies
  - Inconsistently, Globalstar also states that *“still-operating 802.11-based hotspots can provide broadband and voice communications to citizens”* in areas affected by natural disaster or other emergencies<sup>[3]</sup>
  - After a disaster, operating TLPS creates a conflict between first responder and vital consumer communications at a critical time

<sup>[1]</sup> See Petition for Rulemaking of Globalstar, Inc. at 29-30, RM-11685 (filed Nov. 13, 2012) (“Globalstar Petition”) (discussing the need for Globalstar to manage MSS exclusion zones that will result from the deployment of TLPS).

<sup>[2]</sup> *Id.*, 43-44; Kevin Pritchard, “A look inside Globalstar’s plan to build an exclusive nationwide Wi-Fi network”, Gigaom.com, <http://www.gigaom.com/2014/03/17/a-look-inside-globalstars-plan-to-build-an-exclusive-nationwide-wi-fi-network> (Mar. 17, 2014) (“Gigaom Article”).

<sup>[3]</sup> Globalstar Petition at 4.

# Globalstar's Pursuit of TLPS Precludes MSS and Impacts its Future Need for L Band Spectrum

- The M in MSS stands for “Mobile” not “Maybe Satellite Service”
  - Globalstar’s claim that MSS and TLPS will only be used in different places is wrong<sup>[1]</sup>
  - MSS is a nomadic technology; users pay for the promise of mobile, ubiquitous, reliable communications
- Public safety, asset tracking, and other satellite users will not accept Swiss cheese coverage with holes in any populated area
  - Disasters don't happen only in remote/rural areas - Globalstar cites to use of its system after Katrina (New Orleans) and Sandy (New York)<sup>[2]</sup>
  - Once understood that Globalstar’s coverage is hit-or-miss across the country, decline of its duplex business seems likely

<sup>[1]</sup> See Gigaom Article.

<sup>[2]</sup> Globalstar Petition at 9-10; Comments of Globalstar at 5-6, IB Docket 13-213 (filed May 5, 2014).

## Changing MSS Marketplace

- Other major MSS operators are abandoning U.S.-licensed satellite service
  - LightSquared: Business solely focused on terrestrial
  - DBSD & Terrestar: 2 GHz MSS licenses acquired by DISH, to be deployed as AWS-4
  - Globalstar: French-licensed second gen; Terrestrial ambitions which cause MSS exclusion zones; NPRM pending

Iridium is the only U.S. MSS licensee committed to serving and growing the U.S. **satellite** market

# Iridium's Spectrum Petition Timeline



## Iridium's Spectrum Petition Timeline

- February 11, 2013 - Iridium requested additional spectrum to meet growing demand
- December 2, 2013 - Globalstar objected asserting no changed circumstances since 2007, denial of spectrum for Simplex C and Duplex 5-7, and international concerns
- May 5, 2014 - Iridium adapted its proposal based on the facts and concerns raised
- The revised proposal ensures minimal impact on Globalstar, is practical and reasonable

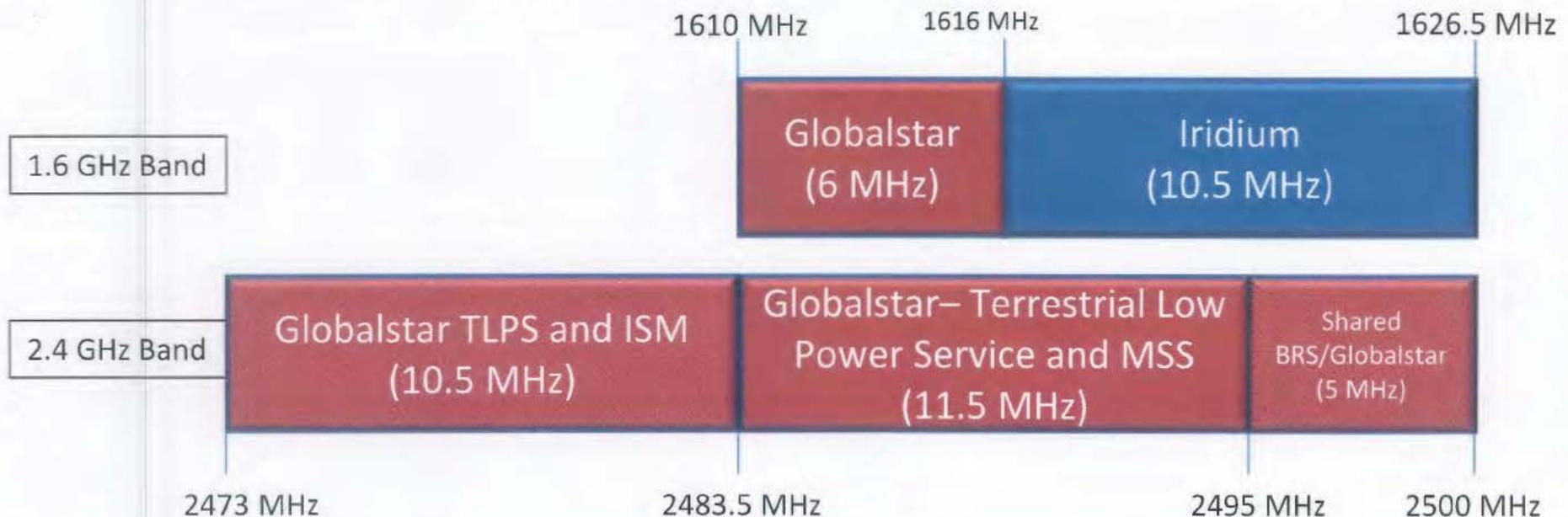
# Iridium's Original Proposal Based on its Growing Spectrum Needs



# Iridium's Original Spectrum Petition (Feb. 11, 2013)

- Sought total of 2.725 MHz new exclusive spectrum for Iridium: 1616-1618.725 MHz (conversion of the 0.95 MHz currently shared, and an additional 1.775 MHz) to match Iridium's 10.5 MHz satellite capability
- Requested consolidation to address Big LEO MSS band holistically

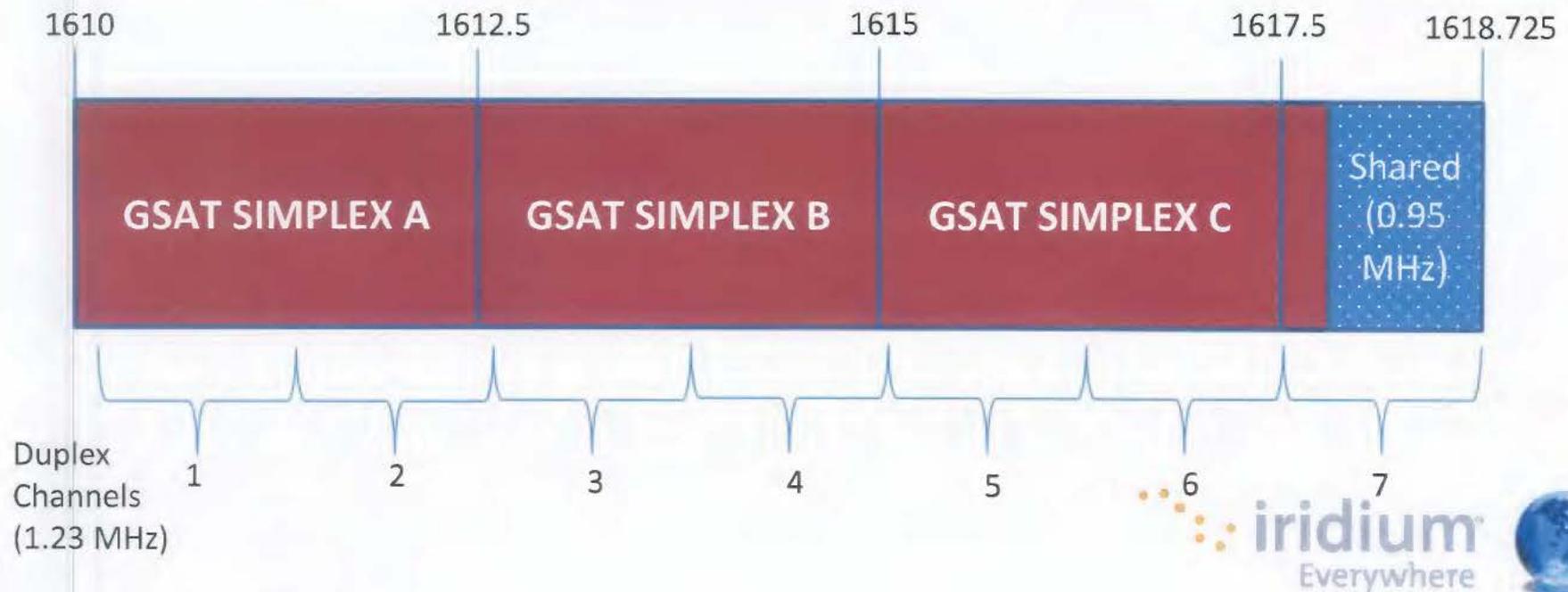
## Iridium Original Petition for Rulemaking Proposal



# Globalstar Opposed Iridium's Original Proposal

- Three sets of arguments
  - No changed circumstances to justify upsetting the 2007 band plan
  - Taking away spectrum above 1616 MHz would deny Globalstar access to Simplex C and Duplex 5-7
  - International arguments

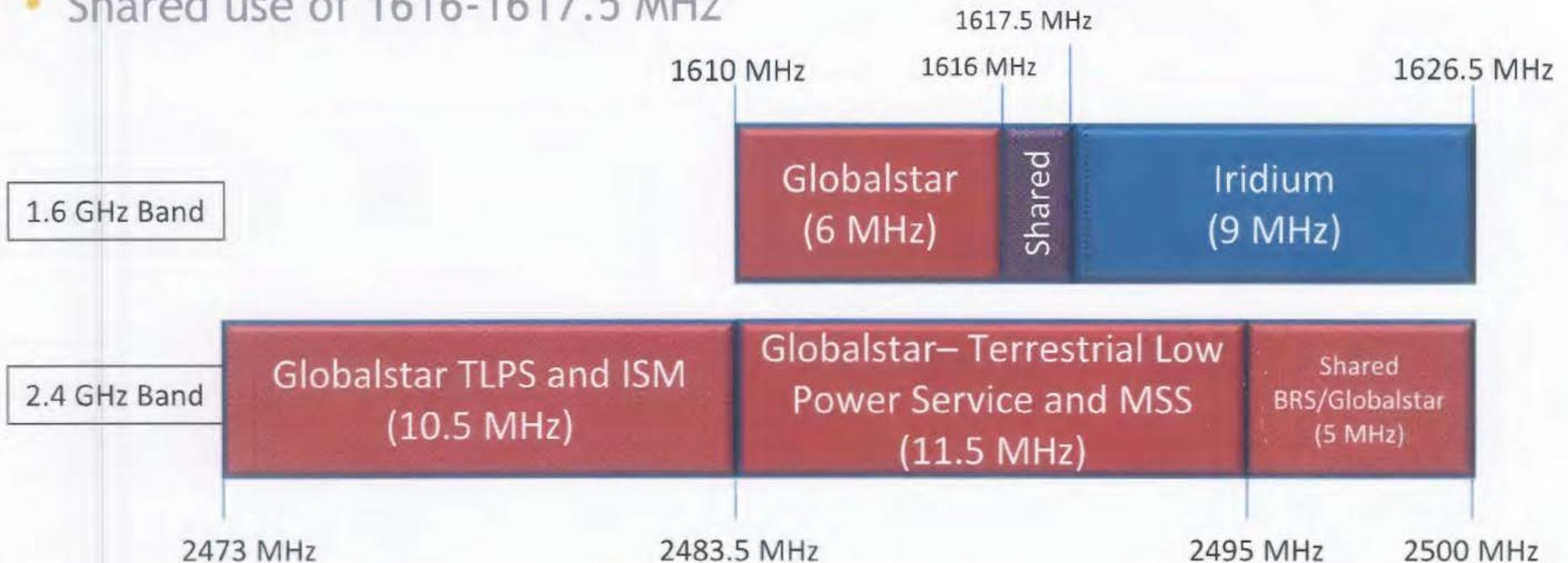
## Globalstar L-Band Channelization



# Iridium's Revised Proposal Resolves Globalstar's Claimed Harms

# Iridium Revised Proposal (May 5, 2014)

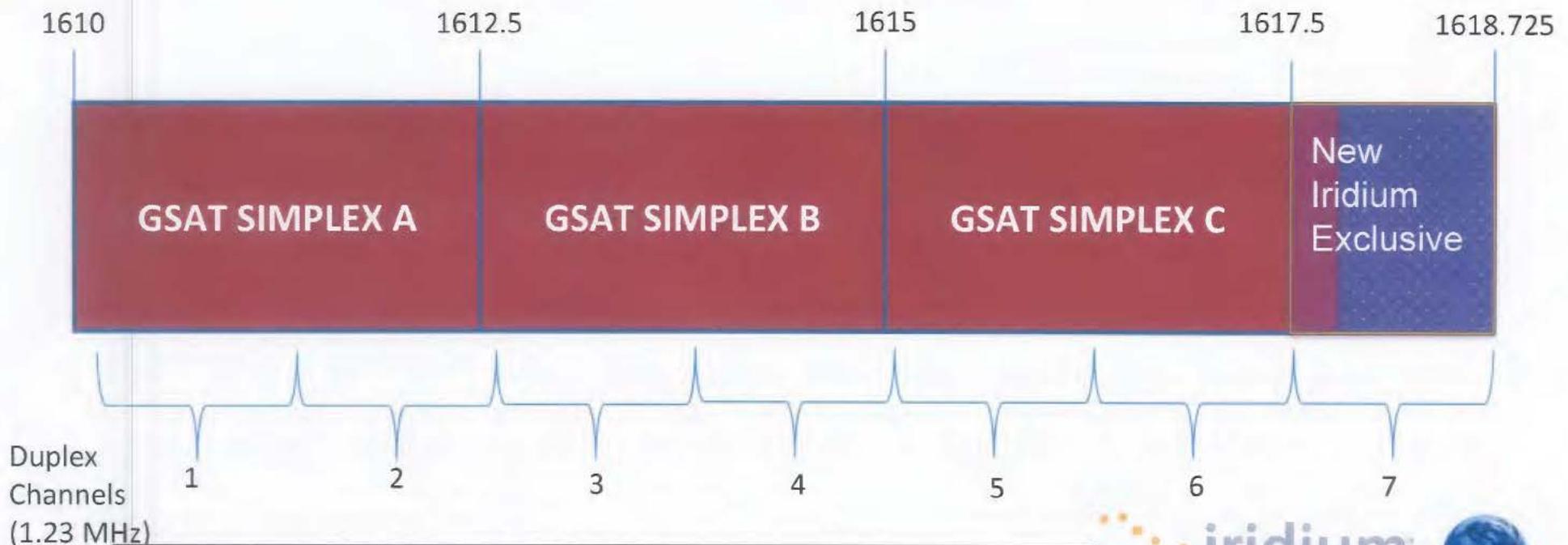
- Iridium exclusive use of the spectrum above Globalstar's Simplex Channel C: 1617.5-1618.725 MHz
- Shared use of 1616-1617.5 MHz



Iridium's Revised Proposal Resolves Every Globalstar Alleged Harm

# Iridium Exclusive Use Above Globalstar Simplex C

- 0.95 megahertz currently shared by Iridium and Globalstar (1617.775-1618.725 MHz); and
- The remaining 0.275 megahertz above Globalstar's Simplex C (1617.5-1617.775 MHz)



## No evidence that Globalstar needs to use Channel 7

- Channel 7 is not used by Globalstar for SPOT/simplex services; the spectrum cannot be added to SPOT devices without recall<sup>[1]</sup>
- Globalstar has not identified a specific active use for this spectrum in the U.S.
  - Generalized statements about need for “Channels 5-7, above 1616 MHz”<sup>[2]</sup> do not mean that Channel 7 is ever used
  - Speculative statements about global use of the L-Band spectrum refer to the French-licensed second generation satellite, subject to international coordination<sup>[3]</sup> (as discussed further below)
  - Globalstar does not have an aviation business today due to its land-based nature and inability to get international certifications for safety services

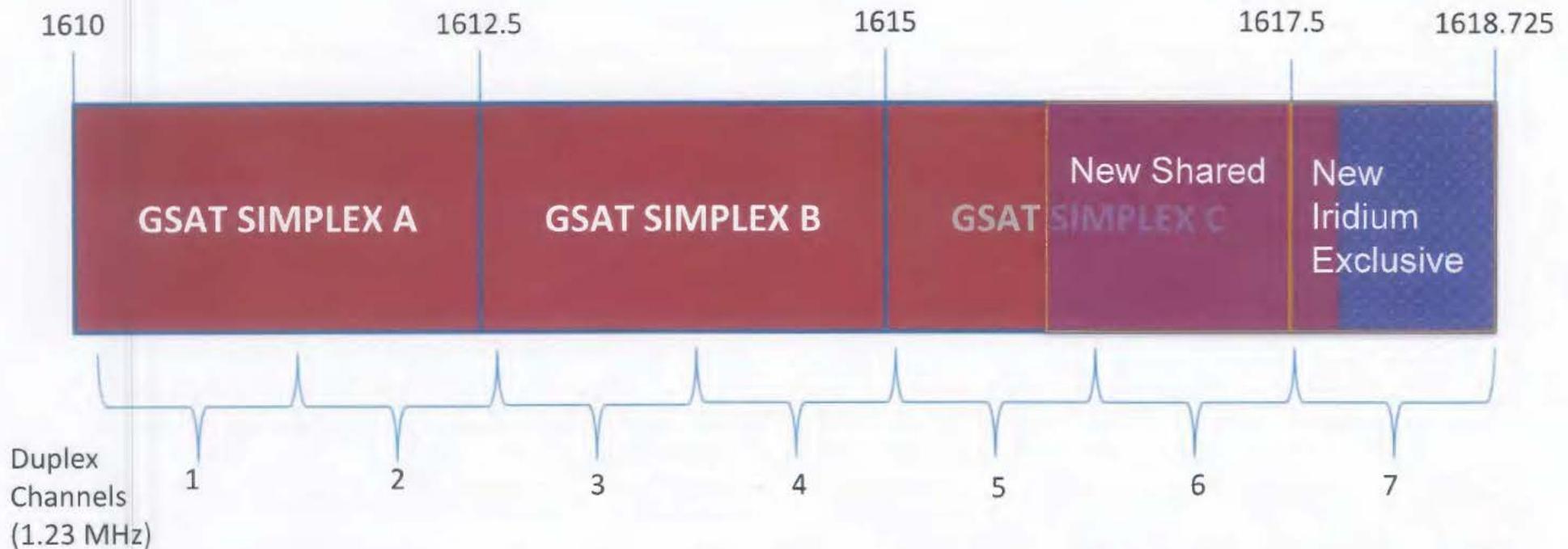
<sup>[1]</sup> See, e.g., Opposition of Globalstar, Inc. to Petition for Rulemaking at 16-17, RM-11697 (filed Dec. 2, 2013) (“Globalstar Opposition”) (discussing need for SPOT recall to change operating frequencies”).

<sup>[2]</sup> See, e.g., *Id.* at 17.

<sup>[3]</sup> See, e.g., Letter from L. Barbee Ponder IV, General Counsel & Vice President Regulatory Affairs, Globalstar, to Marlene H. Dortch, Secretary, Federal Communications Commission, RM-11697 (filed Mar. 14, 2014).

## Shared use of 1616-1617.5 MHz

- Globalstar retains access to the spectrum it currently uses
- Code Division Multiple Access (CDMA) systems tolerate sharing; the band was originally intended to support multiple operators



# International Considerations: Globalstar Went French to Avoid Compliance with the FCC's Band Plan Globally

- Globalstar has gone to extreme lengths to avoid complying with the FCC's Big LEO band plan globally
  - FCC adopted the current Big LEO band plan in 2007 and modified U.S. spectrum authorizations accordingly<sup>[1]</sup>
  - Globalstar immediately sought international waiver of the plan<sup>[2]</sup>
  - Globalstar continued using Iridium's spectrum internationally through 2010 despite IB's instruction to comply, leading to Consent Decree<sup>[3]</sup>
- In 2009, Globalstar amended second generation satellite application to reflect French licensing, explicitly identifying avoiding U.S. spectrum plan internationally as a motivation<sup>[4]</sup>
  - European Commission rules do not reflect the FCC's band segmentation<sup>[5]</sup>

<sup>[1]</sup> *Globalstar Licensee, LLC (Call Sign S2115) et al.*, Order of Modifications, 23 FCC Rcd 15207, ¶ 1 (2008) ("This modification to Globalstar's space station authorization applies to its global space station operations.").

<sup>[2]</sup> *Globalstar Licensee LLC*, Request for Waiver and Request for Special Temporary Authority, IBFS File No. File No. SAT-STA-20081215-00231 (filed Dec. 15, 2008).

<sup>[3]</sup> *Globalstar Licensee, LLC and GUSA Licensee, LLC*, Order, 25 FCC Rcd 13961 (2010).

<sup>[4]</sup> *Globalstar Licensee LLC*, Application for Modification of Non-geostationary Mobile Satellite Service Space Station License, IBFS File No., SAT-AMD-20091221-00147 at 6-7 (Dec. 21, 2009) ("Globalstar French Request").

<sup>[5]</sup> See ECC Decision of 26 June 2009 on the Harmonisation of the bands 1610-1626.5 MHz and 2483.5-2500 MHz for use by systems in the Mobile-Satellite Service, ECC/DEC(09)(02).

## International Considerations: FCC Declined to Require Globalstar to Comply Outside U.S. with 2007 Band Plan

- Globalstar's French license covers its entire 2<sup>nd</sup> generation constellation
- The FCC refused Iridium's request that Globalstar's U.S. market access for its French system be conditioned on abiding by the FCC band plan globally:
  - "Any concern regarding the potential impact of transmissions to second-generation Globalstar satellites from earth stations outside the United States on Iridium's global operations are properly addressed through the ITU international coordination process."<sup>[1]</sup>
- It would be contrary to precedent for the FCC now to deny Iridium access to spectrum based on a concern about impact on Globalstar's French-licensed international operations

<sup>[1]</sup> *Globalstar Licensee LLC Application for Modification of Non-geostationary Mobile Satellite Service Space Station License, Order, 26 FCC Rcd 3948, 3958 ¶ 25 (2011).*

## International Considerations: Globalstar Intends to Ignore Outside the U.S. any FCC Change to the Band Plan

- Globalstar purportedly continues to use up to eight 1<sup>st</sup> generation satellites as part of its 2<sup>nd</sup> generation constellation<sup>[1]</sup>
  - Globalstar's 1<sup>st</sup> gen satellites are beyond their expected operational life; Globalstar expects them to operate through 2016, possibly only in simplex mode<sup>[2]</sup>
  - Globalstar has not asserted that Iridium's proposal would hinder its international activities - only that it would accelerate the decommissioning of the U.S.-licensed satellites, which it plans to do anyway<sup>[3]</sup>
  - 8 degrading satellites past expected life - and possibly not even being used for duplex services - should not dictate long-term spectrum policy
- In the U.S., Globalstar is focused on MSS-precluding terrestrial services, which will not be affected by the modification

<sup>[1]</sup> See Globalstar French Request at 10 (describing plans to use eight 1<sup>st</sup> gen satellites in the "2<sup>nd</sup> gen" constellation).

<sup>[2]</sup> See Supplemental Information for Application of Globalstar Licensee LLC at 4, SAT MOD-20130314-0030 (filed Aug. 19, 2014).

<sup>[3]</sup> Globalstar Opposition at 20-21.

# Iridium's Revised Proposal Answers All Other Globalstar Arguments

# Iridium's Revised Proposal Answers All Globalstar Arguments - Spectrum Access Arguments

- *Claim: Proposal denies access to Simplex C and Duplex 5-7*
  - Resolved - Revised proposal seeks exclusive access only to Channel 7; Globalstar would retain access on a shared basis to the spectrum at 1616-1617.5 MHz, which is Simplex C and Duplex 5 & 6
- *Claim: Globalstar will use every channel/megahertz*
  - Resolved - Channel 7 not used in simplex; TLPS will block duplex operations; it is illogical to assume increased need for duplex spectrum
- *Claim: Proposal would require SPOT recall*
  - Resolved - No changes required to SPOT operations
- *Claim: Proposal would strain capacity on channels 1-4*
  - Resolved - Globalstar retains access to all spectrum it currently uses; any degradation is less severe than the exclusion zones created by TLPS

# Iridium's Revised Proposal Answers All Globalstar Arguments - International Arguments

- *Claim: Iridium's proposal will harm Globalstar's international operations*
  - Resolved - Globalstar has gone to extreme lengths to avoid complying with the FCC's band plan internationally, including changing to French licensing
  - When Iridium has previously requested that the FCC ensure Globalstar's compliance, the FCC declined; it would be contrary to precedent to deny Iridium's request based on the international impact
  - FCC action here would apply to Globalstar's U.S. satellites and market access authorization; 2<sup>nd</sup> gen system would be subject to international coordination

# The Facts in the Record Support Grant of Iridium's Request on the Merits

## Fact: Post-2007 changes have been significant for the Big LEO MSS providers

- Iridium has experienced steady growth in demand, [BHCI] [REDACTED]  
[REDACTED]  
[REDACTED] [EHCI] growth in demand is expected to continue with launch of new services with Iridium NEXT
- Globalstar, like other non-Iridium U.S. MSS operators, is committed to terrestrial deployment in the U.S.
- Globalstar changed to French licensing in part to circumvent U.S. band plan
- TLPS NPRM would change fundamentally the characteristics of the Big LEO MSS Band, removing requirements to provide MSS in MSS spectrum and allowing the introduction of MSS-excluding terrestrial services<sup>[1]</sup>

<sup>[1]</sup> Globalstar Petition at 30-32 (seeking elimination of the Ancillary Terrestrial Component “gating criteria” including the requirement to provide substantial satellite service).

## Fact: Globalstar and Iridium have conflicting visions for the future of Big LEO MSS

- Iridium has always been committed to MSS deployment
- Innovating with its current satellite system, Iridium NEXT is introducing higher-speeds, other advanced services
- Globalstar's short term goal is to deploy TLPS, creating duplex exclusion zones everywhere it is deployed
- Globalstar's long term goal is full terrestrial LTE deployment across its paired spectrum

## Fact: Iridium has existing and future spectrum needs only the L Band can meet

- Iridium's number of subs has tripled since 2007; minutes of use, other metrics, have climbed significantly
- [BHCI] [REDACTED]  
[REDACTED] [EHCI]
- FCC has recognized, through the repeated grant of STA, the need for additional spectrum to support emergency operations
- Some Iridium customers and services require Iridium-exclusive spectrum
- Iridium's current satellites can make immediate use of the spectrum, as will Iridium NEXT following launch beginning next year
- 1.6 GHz Big LEO MSS is the only spectrum the satellites will be capable of using for the next 15-20 years

## Fact: Globalstar's simplex services are not and will not be using exclusive spectrum Iridium seeks

- The new exclusive spectrum is outside of Globalstar's channelization
- Globalstar has made clear that its SPOT devices use 2.5 MHz wide channels and that it cannot re-channel the devices without doing a system-wide recall
- Globalstar will retain access to all of the spectrum currently used by its SPOT and other simplex devices

## **Fact: Globalstar's TLPS proposal precludes duplex services throughout its planned nationwide deployment**

- Globalstar has not refuted the TLPS exclusion zones
- TLPS will undermine the key characteristics of MSS that make it valuable to critical users: mobility, ubiquity, reliability
- MSS is used across the country, not just where the people aren't
- TLPS puts the first responder and the commercial user in contention for spectrum resources at the most critical time

## Fact: Iridium's request will not harm Globalstar's MSS or TLPS operations

- Iridium's showing that its revised proposal causes no real harm to Globalstar's Big LEO MSS or TLPS is not contested in the record before the Commission and the International Bureau
  - Iridium's evidence is undisputed;
  - The FCC must support its decisions with evidence and cannot ignore Iridium's evidence;
  - If the FCC wants to reach a contrary decision, it would need an evidentiary basis in the record;
  - Globalstar is the only party that could potentially rebut Iridium's evidence; and
  - Globalstar has not done so.

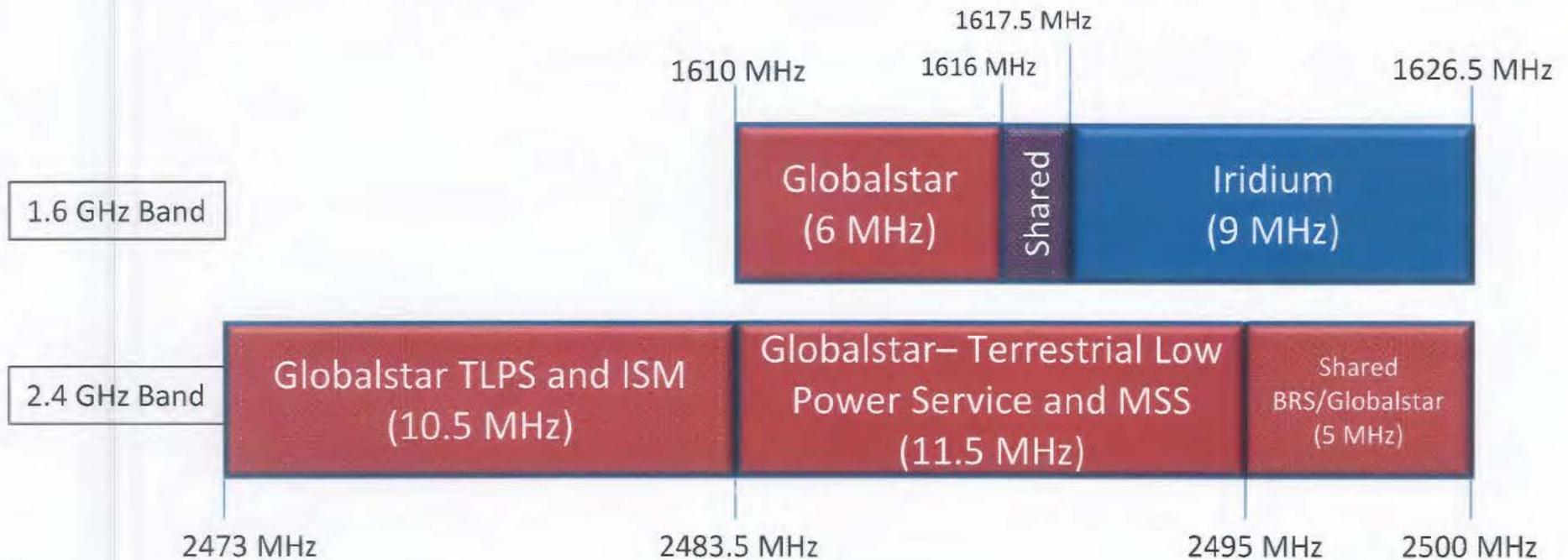
## Fact: Iridium and Globalstar Offer Different Visions for the Big LEO MSS Band

- Globalstar's TLPS Petition reopened the Big LEO MSS band and asked for a fundamental rewriting of the spectrum allocation and service rules
- Globalstar's proposals directly affect Big LEO MSS spectrum use and needs
  - The proposal removes basic rules to ensure MSS spectrum is used for MSS in the United States
  - The proposal creates duplex MSS exclusion zones
  - The long term proposal would introduce LTE mobiles to the 1.6 GHz Band
- Iridium, as the other Big LEO operator, wants to keep MSS in Big LEO
- The FCC has always addressed the 1.6 GHz/2.4 GHz Big LEO spectrum as a single band
- The FCC should reexamine Big LEO MSS spectrum needs holistically and consolidate the Iridium and Globalstar proposals

# Conclusion



# The FCC Should Grant Iridium's Revised Request



- Iridium's proposal will:
  - Address a growing need for additional spectrum to accommodate Iridium's current and future services
  - Ensure spectrum for Iridium's next generation satellite system, which will begin launch in 2015
  - Not interfere with Globalstar's current or future MSS or TLPS operations