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Response to Ofcom Call for Input – Improving Mobile Connectivity from the Sky and Space / Spectrum for Direct to Device and Mobile Satellite Services

On behalf of Globalstar, Inc. ("Globalstar"), we appreciate the opportunity to provide comments in support of the Call for Input issued by the Office of Communications of the United Kingdom ("Ofcom") regarding improving mobile connectivity from the sky and space ("CFI"). As Ofcom is aware, Globalstar has spent the past several years innovating and pioneering such ubiquitous connectivity, which has resulted in the first commercially available, direct-to-device ("D2D") satellite services in the UK, Europe, and many other countries and regions around the world. Globalstar looks forward to further discussions with Ofcom as this field grows and develops.

Introduction to Globalstar and its MSS Business:

Globalstar is a leading provider of global mobile satellite services ("MSS"). Operating continuously in the Big LEO MSS band for more than two decades, Globalstar's non-geostationary satellite orbit ("NGSO") MSS system supports the delivery of MSS to consumers, public safety personnel, and other customers around the world. Globalstar utilizes a "bent-pipe" architecture with satellites that receive and transmit voice and data traffic between an ever-expanding ecosystem of devices and a global network of gateway earth stations. Globalstar's service links are in the Big LEO band at 1610-1618.725 MHz/2483.5-2500 MHz and its feeder and TT&C links at

5091-5250 MHz/6875-7055 MHz.[1] Globalstar's constellation of satellites and ground stations on six continents currently provide affordable, high-quality MSS to more than 781,000 end user customers in more than 120 countries worldwide. Significantly, pursuant to Globalstar's agreements with Apple Inc. ("Apple"), users of the iPhone 14 and 15 (and soon 16) families of devices will have Globalstar MSS connectivity at their fingertips when no terrestrial network is available, including during emergency situations where communications are critical and often lifesaving.[2]

Licensing and Deployment History. On January 31, 1995, the United States Federal Communications Commission ("FCC") authorized Globalstar to construct, launch, and operate a Big LEO MSS system consisting of up to 48 satellites,[3] and Globalstar initiated commercial service over the HIBLEO-4 constellation in 2000.

Globalstar subsequently invested over $1 billion in the development and deployment of its second-generation MSS space stations (HIBLEO-X), licensed by the Republic of France. Globalstar deployed these HIBLEO-X satellites in a series of launches from October 2010 to February 2013, and all 24 of these satellites have been in continuous operation along with the HIBLEO-4 satellites to provide a seamless global service.

[1] The Federal Communications Commission has authorized Iridium to share spectrum with Globalstar in the Big LEO band at 1617.775-1618.725 MHz.
[2] *See* https://support.apple.com/en-us/HT213426.
[3] 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, Order and Authorization, 10 FCC Rcd 2333 (1995). See also Globalstar Licensee LLC; Application for Modification of Non-geostationary Mobile Satellite Service Space Station License; GUSA Licensee LLC; Applications for Modification of Mobile Satellite Service Earth Station Licenses; GCL Licensee LLC, Applications for Modification of Mobile Satellite Service Earth Station Licenses, Order, 26 FCC Rcd 3948, ¶ 2 (IB 2011) ("Globalstar HIBLEO-X License Order").

In September 2014, the FCC extended Globalstar's first-generation HIBLEO-4 license term to October 4, 2024.[4] Most recently, on August 16, 2024, the FCC granted in part and deferred in part Globalstar's application for modification, authorizing the launch and operation of up to 26 replacement HIBLEO-4 satellites and extending the first-generation HIBLEO-4 license term to October 4, 2039.[5]

In the UK, Globalstar operates and provides MSS pursuant to IR2016.4 of the UK Interface Requirements 2016 - 2016.1 to 2016.9 (Land mobile satellite systems).[6] Globalstar's utilization of these same bands of mobile satellite spectrum across Europe has been harmonized through ECC Decision (09)(02), approved June 26, 2009, as amended November 02, 2012.[7]

Globalstar's Current MSS Offerings. Globalstar's global MSS system supports reliable, essential services to consumers, public safety personnel, and customers covered by its network. Since initiating commercial MSS in 2000, Globalstar has focused its MSS products and services on individual consumer and commercial industrial applications. The affordable and innovative "SPOT" MSS devices work virtually everywhere in the world, playing a critical role in providing emergency and safety-of-life services to individual consumers and first responders. Overall, the SPOT family of products to date is responsible for initiating more than 10,000 emergency rescues via satellite in over 100 countries on six continents – often lifesaving, on land and at sea.

Globalstar has also developed an array of satellite Internet of Things ("IoT") solutions for customers in a wide range of industries, including oil and gas, mining, construction, transportation, agriculture, emergency management, government, maritime, and commercial fishing. Globalstar's

[4] Policy Branch Information Actions Taken, Public Notice, 29 FCC Rcd 11258 at 2 (IB 2014) ("First-Generation HIBLEO-4 Extension Grant"); Application of Globalstar Licensee LLC to Modify Authorization to Extend the License Term of NGSO Space Station License, ICFS File No. SAT-MOD-20130314-00030 (filed Mar. 14, 2013).

[5] *Globalstar Licensee LLC Application for Modification of Non-Geostationary Mobile Satellite Service System Authorization*, Order and Authorization, ICFS File No. SAT-MOD-20230804-00192, DA 24-825 (rel. Aug. 16, 2024).

[6] https://www.ofcom.org.uk/__data/assets/pdf_file/0032/84659/ir2016.pdf

[7] https://docdb.cept.org/download/1560

satellite IoT products allow enterprises to streamline their operations and intelligently manage, monitor, and track their mobile assets remotely via Globalstar's MSS network.

Apple and Emergency SOS and Messaging via Satellite. Globalstar is also providing wholesale services to Apple in order to deliver transformational satellite-enabled D2D features for users of the iPhone 14 and 15 (and soon 16) families of devices across Europe and many other countries worldwide.[8] Since its rollout in November 2022, the Emergency SOS via satellite feature has led to numerous emergency and lifesaving rescues.[9] As the first commercially available (D2D)

[8] Apple's Emergency SOS via satellite feature is available in France, eleven additional European countries, United States, Canada, Australia, New Zealand, and Japan. *See* https://support.apple.com/en-us/HT213426. Globalstar's MSS network also supports Apple's Roadside Assistance via satellite feature. *See* https://support.apple.com/en-us/HT213886; Ellen Edmonds, AAA to Provide Roadside Services through Apple's Roadside Assistance via Satellite on the iPhone 15 Lineup, AAA Newsroom (Sept. 12, 2023), https://newsroom.aaa.com/2023/09/aaa-to-provide-roadside-services-through-apples-roadside-assistance-via-satellite. In addition, users of iPhone 14/15 (and soon 16) devices can use the Find My app to share their location with family and friends via satellite when outside cellular and Wi-Fi coverage. *See* https://support.apple.com/guide/iphone/send-your-location-via-satellite-iph2aac8ae20/ios.

[9] *See*, e.g., Remarks of Chairwoman Jessica Rosenworcel, The Global Aerospace Summit, Washington, D.C., at 1 (Sept. 13, 2023), https://docs.fcc.gov/ public/attachments/DOC-396892A1.pdf. See also Charles Martin, Family trapped on Mt. Hood rescued via Emergency SOS via Satellite, appleinsider.com (Mar. 23, 2024), https://appleinsider.com/articles/24/03/23/family-trapped-on-mt-hood-rescued-via-emergency-sos-via-satellite (discussing the rescue of four adults and two children within 24 hours when high altitude combined with bad weather caused them to become stranded); Mary Beth Skylis, One Year in, it's Clear the iPhone's Satellite SOS Feature Is Saving Lives, Backpacker (Dec. 6, 2023), https://www.backpacker.com/news-and-events/news/apple-iphone-satellite-sos-saving-hikers-lives/; Praveena Somasundaram, As Maui fires raged, two friends sent an SOS from a swimming pool, Washington Post (Aug. 17, 2023 4:30 AM), https://www.washingtonpost.com/nation/2023/08/17/lahaina-maui-wildfire-pool-rescue /(describing rescues enabled by Emergency SOS via satellite during the August 2023 wildfires in Maui); Man saved by iPhone technology after car plummets 400 feet over cliff on Mt. Wilson, KCAL News (July 22, 2023 10:23 PM), https://www.cbsnews.com/losangeles/news/man-saved-by-iphone-technology-after-car-plummets-400-feet-over-cliff-on-mt-wilson / (describing a July 2023 rescue after a driver's vehicle plummeted nearly 400 feet from a cliff on Mt. Wilson); Leanne Suter, New satellite SOS feature on iPhone 14 saves Tujunga hiker without cell service, ABC7 Eyewitness News (June 25, 2023), https://abc7.com/tujunga-iphone-rescue-sos-emergency-trail-canyon-falls/13425177/ (reporting on a June 2023 rescue of a hiker with a broken leg in California's Angelos National Forest); Brian Schnee, Stranded canyoneering group uses iPhone feature to get help in remote Utah slot canyon, KUTV (Apr. 18, 2023, 10:12 PM), https://kutv.com/news/local/stranded-canyoneering-group-uses-iphone-feature-to-get-help-in-remote-utah-slot-canyon-the-squeeze-sos-text-message-deep-pools-cold-water-rescue-dps-utah-aero-bureau (describing the rescue of three college students in a deep, remote, water-filled canyon in Utah); Emily Mae Czachor, iPhone emergency feature helps rescue 2 after canyon plunge in California, CBS News (Dec. 15, 2022, 9:35 AM), https://www.cbsnews.com/news/iphone-emergency-sos-satellite-car-crash-

satellite feature, Emergency SOS via satellite has generated a renewed focus on MSS spectrum and the potential offered by satellite connectivity.[10]

Most recently, Apple announced that with iOS 18, users in the United States and Canada will be able to send non-emergency messages via satellite, including texts, SMS, emoji and tapbacks.[11] Apple plans to offer this satellite messaging service, as well as Roadside Assistance via satellite, in the UK later this year.[12]

Globalstar's MSS system will continue to evolve over time to support a growing array of satellite-enabled D2D features and services. Globalstar's use of its few megahertz of MSS spectrum in the Big LEO band will continue to increase rapidly as consumers adopt an expanding range of new D2D satellite features. With the increasingly widespread availability of D2D Emergency SOS and Messaging via satellite features, the Big LEO MSS frequency band is already the most broadly available MSS frequency band in existence and can be used by more people than any other.

GLOBALSTAR'S RESPONSES TO THE SELECT QUESTIONS

9) What current, or future, technology developments will offer the opportunity for more efficient use of MSS spectrum? E.g., more spectrally efficient, or greater ability to share spectrum.

A clear and predictable regulatory framework allows MSS providers to concentrate future investment on building new devices and developing services that maximize the efficiency of the available spectrum. As noted in the CFI, all the terminals that connect to Globalstar satellites –

canyon (recounting the December 2022 rescue of two people in from a car accident in a remote California canyon).

[10] https://www.apple.com/newsroom/2024/06/ios-18-makes-iphone-more-personal-capable-and-intelligent-than-ever/.

[11] https://www.apple.com/newsroom/2024/09/apple-introduces-iphone-16-and-iphone-16-plus/

[12] Id.

including Apple devices – operate under IR2016 license exemptions because they comply with specific technical requirements.

With innovation and technological development as well as growing consumer use/demand for MSS services, increased requirements for access to spectrum may be necessary to offset the corresponding growth in interference risks. It will therefore be important to manage these risks appropriately so as to maximize the efficient use of the spectrum in the interests of consumers. As noted above and below, Globalstar has continuously made substantial investments over time to innovate and deliver MSS for the benefit of the public. It will be important to both safeguard these existing services going forward and continue to ensure a stable, predictable regulatory environment that supports further investment and innovation.

Regulatory certainty and consistency are crucial for attracting sustained commercial investment. Under the UK's current regulatory framework, Globalstar and Apple have already successfully launched the first commercially available D2D service, Emergency SOS via Satellite, and will expand this service to non-emergency messages later this year. The UK's regulatory consistency helps ensure it is one of the first countries to receive new services and features as they are deployed. If countries deviate from established international standards, such fragmentation would limit satellite operators' ability to offer consistent services globally and maximize spectrum efficiency. Globalstar looks forward to working with Ofcom as it considers how best to enable the continued evolution of MSS services and D2D services.

10) Could your existing, or proposed, service coexist with other users of the same frequencies within the MSS spectrum bands? If so, how is coexistence achieved? If not, please explain why sharing is not possible.

Co-Frequency sharing of Mobile MSS bands has never been successfully implemented in real systems. This is especially true for intensively used spectrum. Given Globalstar's large and diverse subscriber base, co-channel MSS operations would inevitably cause harmful interference

to Globalstar's MSS offerings, resulting in degraded reliability, decreased capacity, reduced coverage, and lost investment expectations. Globalstar's terminals receive and transmit mobile satellite services globally, and their omni-directional antennas were designed to operate in the current MSS regulatory and technical environment. These terminals not only include Apple devices, but Globalstar's SPOT family of MSS devices, which play a critical role in providing emergency and safety-of-life services to individual consumers and first responders.

The CFI mentions co-channel/co-geographic sharing between broadband providers using mobile terminals as a possible model for MSS bands. These Earth Stations In Motion (ESIM) terminals do not use omni-directional antennas and must conform to the ePFD rules developed for sharing the Ka band, which were adapted from the old FSS sharing rules. Given the nature of MSS services and their reliance on omni-directional antennas, physics dictates that it is not possible for a new entrant to provide commercially viable MSS using a satellite network operating co-frequency over the same regions as Globalstar without meaningfully exceeding the applicable interference thresholds. Any new entrant deploying its own mobile services on a co-frequency basis in the same geographies would thus cause harmful interference to Globalstar's MSS operations, inevitably resulting in severe constraints on the number of terminals, the terminals' operating characteristics and locations, and available capacity to serve those terminals. These detrimental effects would not only jeopardize the D2D services under consideration in this CFI but limit the critical public safety benefits of all of Globalstar's emergency and safety-of-life services.

By way of example, please refer to the information provided in the separate Confidential Annex in relation to the risks of interference to Globalstar's service.

Additionally, band segmentation is not a feasible option in the MSS band in which Globalstar operates. There is simply not enough spectrum in the Big LEO band to segment it between multiple operators. Going forward, band segmentation would leave MSS operators with insufficient channel bandwidth to continue to support existing services, introduce new services, and justify the massive investments needed to fund and operate future systems.

Globalstar appreciates the opportunity to provide information in response to these very important topics and looks forward to working with Ofcom as it considers how best to enable the continued evolution of MSS and D2D services.

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