

**Before the
Federal Communications Commission
Washington, DC 20554**

In the Matter of	)	
	)	
Inmarsat Inc.	)	IBFS File No. _____
	)	
Request for Market Access for Inmarsat-6 F2	)	
Spacecraft to Communicate with a Gateway	)	
Earth Station in Southbury, Connecticut and to	)	
add the Inmarsat-6 F2 Spacecraft to the ISAT	)	
List at the 28° W.L. Orbital Location	)	

APPLICATION

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APPLICATION

I. Introduction

By this earth station application, Inmarsat Inc. (“Inmarsat”) seeks U.S. market access for the Inmarsat-6 F2 (“I6-F2”) spacecraft, which is owned by Inmarsat Group Holdings Ltd. and will be operated at the nominal 28° W.L. orbital location under the authority of the United Kingdom, and authority to communicate with I6-F2 through a gateway earth station in Southbury, Connecticut (the “Southbury Gateway”). Inmarsat also seeks authority to add I6-F2 to the list of Inmarsat satellites approved to serve the United States using L-band frequencies (the “ISAT List”).¹ As discussed below, grant of this application will serve the public interest.

¹ See Inmarsat, Inc., *Request to Streamline Licensing of L-Band Mobile-Satellite Service Terminals Using Inmarsat Satellites as Points of Communication*, 23 FCC Rcd. 15268 (2008) (“ISAT List Order”).

II. Service Description

A. Space Segment

Internationally, I6-F2 will provide mobile-satellite service (“MSS”) and fixed-satellite service (“FSS”) using frequencies in the L-band, C-band, and Ka-band. However, for the purpose of this application, Inmarsat requests only that the Commission:

- add I6-F2 to the Commission’s Permitted Space Station List (“Permitted List”) for FSS in conventional Ka-band spectrum: 18.3-18.8 GHz, 19.7-20.2 GHz, 28.35-28.6 GHz, and 29.25-30 GHz;
- permit the Southbury Gateway to communicate with I6-F2 in the 17.7-20.2 GHz and 27.5-30.0 GHz bands for FSS; and
- add I6-F2 to the ISAT List for the provision of MSS in the L-band frequencies.

The following table summarizes the above, proposed frequencies band use.

Direction	Frequency Band	Request
Earth-to-space	1626.5-1660.5 MHz ²	ISAT List
space-to-Earth	1525-1559 MHz	ISAT List
Earth-to-space	27.5-28.35 GHz, 28.6-29.25 GHz	Southbury Gateway license
space-to-Earth	17.7-18.3 GHz, 18.8-19.7 GHz	Southbury Gateway license
Earth-to-space	28.35-28.6 GHz, 29.25-30 GHz	Southbury Gateway license and Permitted List
space-to-Earth	18.3-18.8 GHz, 19.7-20.2 GHz	Southbury Gateway license and Permitted List

For the avoidance of doubt, while Inmarsat’s ITU filing and I6-F2 satellite includes frequencies in the C-band, Inmarsat only seeks access in the United States to the L-band and Ka-band frequencies shown in the table above. Use of the C-band frequencies in the United States would be pursued in a separate application, as appropriate. For completeness, the full frequency plan is shown in Annex 1 of Exhibit A.

² Per 47 C.F.R. § 25.202(a)(4)(iii)(B), Inmarsat will operate the frequencies 1544-1545 MHz and 1645.5-1646.5 MHz for distress and safety communications.

B. Ground Segment

The Southbury Gateway, located at 41° 27' 6.7" N, 73° 17' 23.6" W, is a 13.2-meter diameter antenna capable of operating in the Ka-band frequencies, 27.5-30.0 GHz (Earth-to-space) and 17.7-20.2 GHz (space-to-Earth). Inmarsat will seek authority to operate user equipment or terminals in separate application(s).

III. Grant of the Application will serve the Public Interest, Convenience, and Necessity

The I6-F2 spacecraft will be operated under the authority of the United Kingdom.³ Consequently, the Commission's *DISCO II* framework applies to this application.⁴ Under the *DISCO II* framework, the Commission will grant requests for U.S. market access that serve the public interest, convenience, and necessity.⁵ The *DISCO II* analysis includes consideration of a number of factors, such as the effect on competition in the United States, spectrum availability, eligibility requirements, technical requirements, national security, law enforcement, foreign policy and trade concerns.⁶ Inmarsat will comply with all eligibility and operating requirements, and the remaining public interest factors strongly weigh in favor of granting this application.

A. Effect on Competition in the United States

Granting the application will enhance competition in the United States by expanding access to advanced mobility technologies.

³ The United Kingdom has submitted on behalf of Inmarsat an ITU filing under the name INMARSAT-6-28W, as published by the ITU in IFIC 2875 (CR/C/4703) on July 24, 2018.

⁴ *Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Satellites Providing Domestic and International Service in the United States*, 12 FCC Rcd 24094, ¶¶ 30-49 (1997) ("*DISCO II*").

⁵ See *DISCO II* at ¶ 7; 47 C.F.R. § 25.137(a).

⁶ See e.g., Telesat Canada, *Petition for Declaratory Ruling for Inclusion of Anik F2 on the Permitted Space Station List, Petition for Declaratory Ruling to Serve the U.S. Market Using Ka-band Capacity on Anik F2*, 17 FCC Rcd 25287, ¶ 6 (2002).

1. I6-F2 Will Continue to Enable Global Mobility Communications

Inmarsat is the world leader in global mobile satellite communications and operates a global fleet of spacecraft, including some of the most flexible commercial communications satellites now in orbit. Examples of the users that rely on Inmarsat services for their critical communications needs include: the U.S. military, the Federal Aviation Administration, the Department of Homeland Security (including the Federal Emergency Management Agency (FEMA) and the Coast Guard), U.S. Executive Branch officials, the New York City Fire Department, CNN, ABC, CBS, National Public Radio, the Red Cross, and nearly every major airline and shipping line throughout the world. Inmarsat is trusted by mariners, military, airlines, and enterprises to keep people and assets securely connected everywhere in the world through the toughest ground conditions. Its fleet of geostationary satellite orbit (“GSO”) satellites provides voice, video, broadband, and mission-critical Internet of Things solutions across disparate platforms, including inflight, at sea, on land, and even in space. Throughout its 43-year existence, Inmarsat has propelled the satellite industry forward with innovative connectivity solutions.

Inmarsat provides reliable MSS capacity using L-band spectrum and flexible FSS capacity using Ka-band spectrum. I6-F2 is one of the largest and most sophisticated commercial communications satellites ever launched and one of the first hybrid L-/Ka-band satellites that will offer both MSS and FSS from one spacecraft. The L-band payload (commercially known as ELERA) will continue its critical mission of maritime and aviation safety services along with new functionality to connect autonomous transport and unmanned aeronautical vehicles and relay data to and from an extensive range of Internet of Things (IoT) devices. The Ka-band payload (commercially known as Global Xpress or GX) will continue the successful satellite broadband offerings with flexible high-throughput capacity to anywhere in the field of view of

the satellite. This payload supports broadband Internet access as well as multimedia, voice, and other data applications. The GX payload provides service to users of both fixed and mobile terminals.⁷

The I6-F2 spacecraft provides 20 steerable spot beams for the GX payload and a nine-meter unfurlable antenna fed by 112 elements for the ELERA payload resulting in nearly 200 narrow beams with upwards of 55x frequency re-use. With the 112 elements, the ELERA payload can beamform any combination of narrowbeam, widebeam, global beam or dynamic beam necessary to satisfy the mission requirements. The onboard digital signal processor allows for any combination of traffic routing to ensure the most efficient landing point of user communications. The steerable GX beams can be deployed to accommodate known congested traffic areas or used flexibly to support increased demand in emergency situations. The system is designed to adaptively utilize large segments of the Ka-band in a way that maximizes the spacecraft platform capacity but has flexibility from the digital channelizer to dynamically choose frequencies. The I6-F2 satellite is planned for launch on a SpaceX Falcon 9 rocket from Cape Canaveral, Florida in the first quarter of 2023.

The Inmarsat-6 series satellites represent one of the largest investments ever made by Inmarsat. Each satellite will be backwards-compatible with the existing ELERA and GX user terminals such that current and future users will experience the enhanced performance of the Inmarsat-6 satellites. This investment demonstrates Inmarsat's ongoing commitment to deliver unique capability to our global military, government, and IoT customers.

In summary, the proposed Southbury Gateway will be a critical part of a system that will advance the Commission's goals of enhancing competition and promoting the growth and

⁷ Authority for user terminals is beyond the scope of this application and will be sought in a separate filing.

development of cost-effective satellite services, providing innovative new service offerings to users wherever they may be located. Granting this earth station application therefore will serve the public interest and advance Commission objectives.

2. These Capabilities Will Promote U.S. Satellite Competition

In *DISCO II*, the Commission established a rebuttable presumption that it will further competition in the United States to allow non-U.S. satellites authorized by WTO Members to provide services covered by the U.S. commitments under the WTO Basic Telecommunications Agreement.⁸ The United Kingdom is a WTO Member. Further, Inmarsat seeks to use the requested spectrum to provide satellite services that are covered by the WTO Basic Telecommunications Agreement.⁹ Accordingly, the presumption in favor of entry applies to the I6-F2 spacecraft.

Allowing Inmarsat to serve the U.S. with the I6-F2 spacecraft would help fulfill the promise of the WTO Basic Telecommunications Agreement with respect to satellite communications services. Even absent the presumption, granting this application would unquestionably satisfy this public interest factor. Granting market access to the I6-F2 satellite will enhance competition in the United States by facilitating the introduction of Inmarsat's satellite services, thereby stimulating lower rates, improving service quality, increasing service options, and fostering technological innovation. U.S. companies in the energy, supply chain management, mining, fishing, shipping and aviation industries will especially benefit from these services, as will U.S. government customers that depend on global satellite connectivity.

Additionally, the technology and services offered by GX will stimulate growth and strengthen

⁸ *DISCO II* at ¶ 39; *see also* 47 C.F.R. § 25.137(a)(2).

⁹ Inmarsat does not propose to use this spacecraft to provide direct-to-home video or audio services, which are not covered by the United States' commitment under the WTO Basic Telecommunications Agreement.

the U.S. economy by enabling U.S. companies that rely on these communication services to compete more efficiently in the global market. GX will also provide the diverse user community, including government, media, enterprise, and other end users, with increased flexibility and reliability in their communications options.

The Commission consistently has relied on these same public interest benefits in granting similar requests for market access.¹⁰

B. Spectrum Usage and Availability

As noted above, the I6-F2 spacecraft would serve the United States using portions of the L-band and the Ka-band from the nominal 28° W.L. orbital location. The Southbury Gateway seeks to communicate with the I6-F2 spacecraft using the 27.5-30.0 GHz (Earth-to-space) and 17.7-20.2 GHz (space-to-Earth) bands.

As demonstrated in the Technical Supplement, Inmarsat's proposed operations in the Ka-band frequencies will be fully compliant with the Commission's two-degree spacing requirements, will not cause harmful interference to any other authorized user of the spectrum, and will be compatible with future Ka-band assignments that operate consistent with the Commission's rules.¹¹ As detailed below, Inmarsat respectfully requests waivers of the U.S. Table of Frequency Allocations and the Commission's Ka-band frequency plan and Section 2.106 of the Commission's rules to use certain frequencies to serve the U.S. market.

¹⁰ See, e.g., Stamp Grant, SES-17 S.a.r.l., IBFS File No. SAT-PDR-20190305-00014 (granted May 8, 2020); Stamp Grant, Telesat International Limited, IBFS File No. SAT-PPL-20160225-00020 (granted Aug. 31, 2016).

¹¹ At the time of submitting this application, no other satellite is authorized in these frequencies within two degrees of the 28° W.L. orbit location.

1. 17.7-20.2 GHz (space-to-Earth)

a) 17.7-18.3 GHz

The 17.7-18.3 GHz band is allocated to the fixed service (“FS”) on a primary basis and the FSS service on a secondary basis in the downlink direction.¹² Inmarsat’s operations in the 17.7-18.3 GHz band will not cause harmful interference to, or claim protection from, operators in the FS or BSS.

In the 17.8-20.2 GHz frequencies, Federal space stations in both GSO and non-geostationary satellite orbits (“NGSO”) and associated earth stations in the FSS (space-to-Earth) may be authorized on a primary basis.¹³ Inmarsat has engaged with the appropriate U.S. Government agencies and obtain the necessary coordination arrangements pursuant to applicable U.S. Table of Frequency Allocation footnotes. Specifically, Inmarsat has completed US334 coordination with the applicable Federal users in advance of commencing full-time operations from the Southbury Gateway.¹⁴

b) 18.3-18.8 GHz and 19.7-20.2 GHz

The 18.3-18.8 GHz and 19.7-20.2 GHz bands are allocated to the FSS on a primary or co-primary basis in the downlink direction. The proposed communications over the I6-F2 spacecraft comply with the downlink PFD levels specified in Section 25.140 of the Commission rules.¹⁵

¹² In the 17.7-17.8 frequency band, there is also an FSS uplink allocation limited to feeder links for broadcasting-satellite service (“BSS”).

¹³ 47 C.F.R. § 2.106 n.US334.

¹⁴ Inmarsat completed coordination with federal spectrum managers for the short-term testing of the Southbury Gateway, authorized pursuant to SES-STA-20220819-00891 and SES-STA-20221020-01153. This application will require a separate coordination agreement from Federal users pursuant to US334.

¹⁵ 47 C.F.R. § 25.140(a)(3)(iii).

c) 18.8-19.3 GHz

The 18.8-19.3 GHz band is allocated to the FSS on a primary basis. As required by the U.S. Table of Frequency Allocations, the proposed communications in this band will not cause harmful interference to, or claim protection from, NGSO systems in the FSS.¹⁶ As an unprotected user in the 18.8-19.3 GHz, Inmarsat will accept interference from NGSO FSS operations in the band unless otherwise coordinated with NGSO FSS operators. Further, unless otherwise coordinated Inmarsat's operations will be on a non-interference basis, and Inmarsat will immediately cease operations upon notification of any harmful interference. As mentioned above, the I6-F2 satellite employs a digital channelizer which allows Inmarsat to flexibly switch transmissions out of this band and into adjacent frequencies should harmful interference be reported.

d) 19.3-19.7 GHz

The 19.3-19.7 GHz band is allocated to the FSS in the downlink direction on a primary basis and is available to GSO FSS in the 19.3-19.4 GHz and 19.6-19.7 GHz frequency bands. However, the 19.4-19.6 GHz frequency band is restricted to feeder links for NGSO systems in the MSS.¹⁷ As discussed below, Inmarsat requests a waiver of the Commission's rules to use the 19.4-19.6 GHz frequencies.¹⁸

2. 27.5-30 GHz (Earth-to-space)

a) 27.5-28.35 GHz

The 27.5-28.35 GHz band is allocated to FSS on a primary basis in the U.S. Table of Frequency Allocations. The FSS is secondary to the Upper Microwave Flexible Use Service

¹⁶ 47 C.F.R. § 2.106 n.NG165.

¹⁷ 47 C.F.R. § 2.106 n.NG166.

¹⁸ See *infra* Section VI.A.1.

(“UMFUS”) pursuant to Section 25.136 of the Commission’s rules. However, an applicant for a license for a transmitting earth station in the 27.5-28.35 GHz band may be authorized to operate without providing interference protection to stations in the UMFUS if it meets certain criteria.¹⁹ Inmarsat has commissioned a study to seek such protected status under Section 25.136 of the Commission’s rules for the Southbury Gateway.²⁰ A copy of the frequency coordination report and study is attached as Exhibit C. As demonstrated in the study, the Southbury Gateway uplink operations comply with Commission rules and guidelines necessary to obtain protected status.

b) 28.35-28.6 GHz and 29.25-30.0 GHz

The 28.35-28.6 GHz and 29.25-30.0 GHz bands are allocated to the GSO FSS on a primary or co-primary basis in the downlink direction. The proposed communications over the I6-F2 spacecraft comply with the uplink off-axis EIRP density specified in Section 25.218(i) of the Commission rules.²¹

c) 28.6-29.1 GHz

The 28.6-29.1 GHz band is allocated to the NGSO FSS on a primary basis and GSO FSS operations on a secondary basis. Inmarsat has completed coordination or is in the process of coordination discussions with NGSO FSS systems operating or planning to operate in this frequency range. Inmarsat will accept interference from NGSO FSS operations in the 28.6-29.1 GHz band unless otherwise coordinated with NGSO FSS operators. Further, unless otherwise coordinated Inmarsat’s operations will be on a non-interference basis, and Inmarsat will immediately cease operations upon notification of any harmful interference. As mentioned above, the I6-F2 satellite employs a digital channelizer which allows Inmarsat to flexibly switch

¹⁹ See 47 C.F.R. § 25.136(a).

²⁰ 47 C.F.R. § 25.136(a)(4).

²¹ 47 C.F.R. § 25.218(i).

transmissions out of this band into adjacent frequencies should harmful interference be reported. Finally, the I6-F2 network will accept interference from NGSO FSS operations in this band segment unless otherwise coordinated with NGSO FSS operators.

d) 29.1-29.25 GHz

The 29.1-29.25 GHz band is allocated to the FSS on a primary basis limited to feeder links for NGSO systems in the MSS and the local multipoint distribution service (“LMDS”). Inmarsat seeks a waiver of the Commission’s rules to operate the Southbury Gateway in this frequency band. The Commission has previously granted use of this band by GSO FSS earth stations on an individually licensed and non-interference basis, if the stations were not otherwise coordinated.²² The Technical Supplement contains a quantitative demonstration of how Inmarsat can coexist with feeder links for NGSO systems in the MSS. As explained therein, operations at the Southbury Gateway are compatible with the closest NGSO MSS feeder link earth station, operated by Iridium and located in Tobyhanna, PA, provided the Southbury Gateway earth station operates in opposite polarization. Inmarsat requests authority to operate in both polarizations and has demonstrated that cross-polar operations are compatible with Iridium. Inmarsat recognizes that co-polar operations may cause unacceptable interference to Iridium and requests that the co-polar frequencies be authorized but their operation be conditioned on first completing coordination with Iridium.

3. L-band

In October 2008, the Commission adopted an order establishing the ISAT List, a list of Inmarsat satellites approved to serve the United States using L-band frequencies which includes

²² See *Inmarsat Mobile Networks, Inc. Application to Operate a Fixed-Satellite Service Gateway Earth Station Facility in Lino Lakes, Minnesota with the Inmarsat-5 F2 Space Station*, IBFS File Nos. SES-LIC-20120426-00397, SESAMD-20120823-00781, and SES-AMD20150114-00008, Order and Authorization and Declaratory Ruling, 30 FCC Red 2770, 41 (2015).

those Inmarsat satellites that have been found to meet the Commission's legal, technical, and policy requirements for access to the U.S. market.²³ The ISAT List allows earth station licensees and applicants to seek authority to communicate in the L-band with satellites listed on the ISAT List, rather than having to seek authorization to communicate with Inmarsat satellites on a satellite-by-satellite and orbital-location-by-orbital-location basis.²⁴ The Commission also provided that new Inmarsat satellites could be added to the ISAT List through a petition for declaratory ruling and demonstrating that the proposed operations satisfy the Commission's legal, technical, and policy requirements.²⁵

Inmarsat submits the relevant information in this application and requests the Commission add the I6-F2 satellite to the ISAT List.²⁶ As stated in the ISAT order, the Commission intended that the earth station application process would be a method by which satellites could be added to the ISAT List.²⁷ Accordingly, and consistent with the Commission's rules generally with respect to market access, Inmarsat submits that a request submitted in the context of an earth station application is sufficient.²⁸ The requirements of 25.137 for earth stations seeking authority to operate with a non-U.S. licensed satellite parallel those of a petition for declaratory ruling. Further, as discussed above and in the ISAT List Order, the public

²³ See *ISAT List Order* at ¶ 1.

²⁴ *Id.*

²⁵ *Id.* at ¶ 8.

²⁶ To the extent necessary, for the reasons discussed in this paragraph, Inmarsat requests a waiver of the Commission's rules in the event the FCC concludes that a separate petition for declaratory ruling is required.

²⁷ *ISAT List Order* at fn. 21 ("Inmarsat may file a Petition for Declaratory Ruling to add an Inmarsat satellite to the ISAT List prior to the filing of earth station applications to access the satellite, or it may wait until the Commission has approved an earth station application to access the satellite prior to filing a Petition for Declaratory Ruling to add the satellite.").

²⁸ See 47 C.F.R. § 25.137 (establishing application requirements for requests for U.S. market access through non-U.S.-licensed space stations, either through filing a petition for declaratory ruling to access the United States market using a non-U.S.-licensed space station or through applying for an earth station license requesting authority to communicate with a non-U.S.-licensed space station).

interested would be served by “eliminating duplicative and repetitive filings” so that satellite services could be rapidly deployed to U.S. consumers.²⁹

IV. National Security, Law Enforcement, and Public Safety Matters

Grant of this application would be consistent with U.S. national security, law enforcement and public safety considerations. Inmarsat’s operations in the United States are subject to a network security agreement between Inmarsat on the one hand and the U.S. Department of Justice and the Department of Homeland Security on the other, dated September 23, 2008, as amended (the “Agreement”). Pursuant to the terms of the Agreement, any FCC authorizations granted to Inmarsat must be conditioned on compliance with the terms of the Agreement. Inmarsat requests that the Commission adopt the following condition in granting this spectrum reservation request:

This authorization and any licenses related thereto are subject to compliance with the provisions of the Agreement between Inmarsat, on the one hand, and the U.S. Department of Justice and the Department of Homeland Security, on the other hand, dated September 23, 2008, as amended.

V. Other Eligibility and Operational Requirements

In addition to meeting the technical requirements applicable to Inmarsat’s proposed spectrum use, Inmarsat will comply with all other relevant eligibility and operational rules.

A. Reporting Requirements

Inmarsat will comply with all applicable reporting requirements for the I6-F2 spacecraft.³⁰

²⁹ *ISAT List Order* at ¶ 1.

³⁰ 47 C.F.R. § 25.171 and 47 C.F.R. § 25.172.

B. Spectrum Usage

Section 25.137(d)(5) of the Commission's rules does not apply. Inmarsat has no other pending or granted spectrum reservation requests involving unbuilt spacecraft to which the limits of Section 25.137(d)(5) of the Commission's rules would apply.

C. Ownership Information

Inmarsat's ownership information is provided in Exhibit E.

VI. Waiver Requests

The Commission may waive its rules for good cause shown.³¹ When applying the good cause standard, the Commission evaluates whether "special circumstances warrant a deviation from the general rule" and whether "such deviation would better serve the public interest than ... strict adherence,"³² accounting for hardship, equity, the rule's purpose, and whether a waiver would result in a "more effective implementation of overall policy."³³ Inmarsat requests the following waivers in connection with this application.

"Good cause" exists for the Commission to grant the requested waivers.³⁴ As an initial matter, such grant "would better serve the public interest than strict adherence to the general rule,"³⁵ in that the requested waivers would facilitate users' ability to have access to new and innovative high-data rate communications services, including broadband Internet access, as well as multimedia, voice, and other data applications, as described in Section III above.

³¹ 47 C.F.R. § 1.3; *see also* *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969), cert. denied, 409 U.S. 1027 (1972); *Northeast Cellular Telephone Co., LP v. FCC*, 897 F.2d 1164 (D.C. Cir. 1990).

³² *GE American Communications, Inc.*, Order and Authorization, 16 FCC Rcd. 11038, ¶ 9 (2001).

³³ *WAIT Radio*, 418 F.2d at 1159.

³⁴ *See* 47 C.F.R. § 1.3.

³⁵ *See* *WAIT Radio*, 418 F.2d at 1157.

A. U.S. Table of Frequency Allocations

Grant of the requested waivers with regards to the U.S. Table of Frequency Allocations would allow Inmarsat to introduce advanced satellite technologies that would make more efficient use of frequency bands that currently are underutilized. With regards to the Ka-band, reusing currently underutilized segments of the Ka-band is consistent with the Commission's objectives of maximizing spectrum deployment for the benefit of the public. Importantly, the design of Inmarsat's global I6-series satellite system obtains efficiencies when using the full range of the Ka-band frequencies allocated to the FSS on an international basis. These efficiencies cascade to cost-effective satellite broadband services. This will especially facilitate the provision of service to users that will benefit from global availability of the GX service, such as the U.S. government.

Grant of the requested waivers thus would ensure that users will have access to cost-effective, innovative, and ubiquitously available satellite services in the U.S. and abroad. At the same time, grant of the requested waivers "would not undermine the policy objective of the rule in question and would otherwise serve the public interest."³⁶ As explained below, Inmarsat would ensure that its operations do not cause harmful interference into primary and secondary operations in each of these bands. As discussed in the Technical Supplement, Inmarsat accepts interference into its operations caused by primary uses in the band segments where waiver is sought.

³⁶ *Northeast Cellular Tel. Co. v. FCC*, 897 F.2d 1164 (D.C. Cir. 1990); see also *Fugro-Chance, Inc.*, 10 FCC Rcd 2860, ¶ 2 (1995) (waiver of U.S. Table of Frequency Allocations appropriate "when there is little potential for interference into any service authorized under the Table of Frequency Allocations and when the non-conforming operator accepts any interference from authorized services.").

The subsequent sections address the primary allocations in the relevant frequency segments and explain how Inmarsat would operate on a non-conforming, non-harmful-interference basis in each such band segment.

1. 19.4-19.6 GHz

As discussed above, the 19.4-19.6 GHz band is allocated on a co-primary basis to the FS and the FSS (space-to-Earth) limited to feeder links for NGSO systems in the MSS. Inmarsat requests a waiver of these limitations to permit non-conforming GSO FSS space-to-Earth operations on an unprotected, non-harmful-interference basis into the Southbury Gateway. As demonstrated in the Technical Supplement, I6-F2 will meet the Commission PFD limits to protect terrestrial FS throughout the 17.7-19.7 GHz. Inmarsat will accept interference from any existing and future FS transmission in the 19.4-19.6 GHz frequencies. Additionally, Inmarsat has already initiated coordination discussions with authorized NGSO MSS networks and expects that techniques such as geographic separation among the earth stations, polarization isolation, and power reduction will protect those networks from harmful interference.³⁷ Inmarsat will accept interference from existing and future NGSO MSS operations in 19.4-19.6 GHz frequencies.

2. 29.1-29.25 GHz

The 29.1-29.25 GHz band is allocated on a co-primary basis to the LMDS and MSS feeder links. Inmarsat's gateway uplink operations in the 29.1-29.25 GHz band would not cause harmful interference into LMDS operations, and the one LMDS licensee in the vicinity of the Southbury Gateway has indicated that it does not object to Inmarsat's proposed secondary

³⁷ Inmarsat performed a preliminary review of the IBFS database and found at least one nearby earth station licensed in the 19.4-19.6 GHz. *See* Stamp Grant, General Dynamics Satellite Communication Services, LLC, IBFS File No. SES-LIC-20160722-00673 (granted Sept. 20, 2016).

deployment in this band.³⁸ Accordingly, to the extent necessary, Inmarsat requests a waiver of the U.S. Table of Allocations³⁹ to permit the Southbury Gateway to communicate with the I6-F2 spacecraft using these bands on a non-interference basis.

Inmarsat can successfully operate on a non-interference basis with respect to LMDS operations in the 29.1-29.25 GHz band as it can in the 27.5-29.35 GHz band. The Southbury Gateway is unlikely to cause harmful interference into any LMDS stations that may be deployed in the future. Further, Inmarsat would employ interference mitigation techniques, such as shielding, as necessary to avoid interference into future LMDS stations.

Additionally, Inmarsat's proposed operations will not cause harmful interference into MSS feeder link operations. As demonstrated in the Technical Supplement and discussed above in connection with the 19.4-19.6 GHz frequencies, Inmarsat's proposed operations would not cause harmful interference into Iridium's existing MSS feeder link operations and would be unlikely to cause harmful interference into future MSS feeder link operations. As a non-conforming user of this frequency band, Inmarsat would cease operations in the band in the event of any harmful interference into any LMDS or MSS feeder link operations (as discussed above), and Inmarsat would accept interference from LMDS or MSS feeder link operations in this band segment.

B. 47 C.F.R. § 25.264

Inmarsat seeks a waiver of Section 25.264 which, though not yet in effect, will require applicants for a space station transmitting in the 17.3-17.8 GHz to provide predicted and measured off-axis antenna gain data for each antenna that transmits in any portion of the 17.3-

³⁸ See Exhibit C, 28 GHz Frequency Coordination Report.

³⁹ 47 C.F.R. § 2.106.

17.8 GHz.⁴⁰ At the time of the 17 GHz Report and Order adoption on August 3, 2022, the construction of the I6-F2 satellite was nearly completed.⁴¹ Inmarsat and the manufacturer were not able to introduce new requirements to the construction contract nor complete the specified off-axis antenna gain measurements for the satellite antennas using the 17.7-17.8 GHz frequencies.

As demonstrated in the Technical Supplement, downlinks from the I6-F2 spacecraft in this band would not cause harmful interference into adjacent DBS spacecraft. The off-axis PFD of the I6-F2 spacecraft downlinks would be significantly lower than the levels triggering a coordination requirement for a DBS satellite located at 61.5° W.L., which is the nearest U.S. DBS Region 2 Plan orbital location to the I6-F2 spacecraft at 28° W.L. The Commission has found that waiver was justified in similar cases.⁴²

Although the rule is not yet in effect, to the extent necessary, Inmarsat seeks a waiver of 25.264(c) and (d) which will require licensees to update their predicted transmitting off-axis gain information and corresponding PFD calculation using measured antenna gain information no later than two months before launch. The manufacturing of I6-F2 is nearly complete and anticipated to launch in the first quarter of 2023. As such, the time to perform antenna measurements and update the PFD analysis has passed. Inmarsat believes waiver of this rule would not harm any BSS receiving space stations considering the large margins shown in the

⁴⁰ See *Amendment of Parts 2 and 25 of the Commission's Rules to Enable GSO Fixed-Satellite Service (Space-to-Earth) Operations in the 17.3-17.8 GHz Band, to Modernize Certain Rules Applicable to 17/24 GHz BSS Space Stations, and to Establish Off-Axis Uplink Power Limits for Extended Ka Band FSS Operations. Amendment of Parts 2 and 25 of the Commission's Rules to Enable NGSO Fixed-Satellite Service (Space-to-Earth) Operations in the 17.3-17.8 GHz Band*, Report and Order and Notice of Proposed Rulemaking, IB Docket Nos. 20-330, 22-273, FCC 22-63 (rel. Aug. 3, 2022); see also 87 Fed. Reg. 72388 (November 25, 2022).

⁴¹ See *id.*

⁴² See *ViaSat, Inc. Application for Modification of Market Access Grant and for Extension or Waiver of Milestone Date*, IBFS File No. SAT-MOD-20190617-00047, Order and Declaratory Ruling, 35 FCC Rcd 5416, 16 (2020).

predicted gain analysis and the likelihood that the measured gain analysis would produce similar large margins.

For these reasons, Inmarsat submits that waiver of the 25.264 requirements is justified.

C. 47 C.F.R. § 25.132(d)

Inmarsat seeks a limited waiver of Section 25.132(d)(3), which requires antenna verification measurements be completed on-site in each frequency band of interest and submitted to the Commission. These verification measurements have been performed and recorded in a format that differs from that described in subparagraph 25.132(d)(3). Inmarsat attaches these measurement results to this application in Exhibit F and seeks a waiver of the Commission's rules to provide the cross-polarization measurements with the FCC envelope from Section 25.209 superimposed on each pattern. Only the on-axis cross-polarization discrimination was calculated. Should this waiver request be denied, and verification measurements be needed in the cross-polarization with Section 25.209 envelopes superimposed, Inmarsat requests an opportunity to supplement this application with new verification measurements.

D. Milestones and Bond Requirement

Inmarsat requests waiver of the Commission's milestone and bond requirements.⁴³ The satellite is already constructed, and Inmarsat anticipates launch of the satellite in the first quarter of 2023. Accordingly, there can be no concerns about speculation or spectrum warehousing, and there is no basis to impose the bond requirement.⁴⁴ In similar situations, the Commission has

⁴³ See 47 C.F.R. § 25.137(d)(4)(i); see also Space Station Licensing Reform Order ¶ 311.

⁴⁴ See *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, Second Report and Order, 30 FCC Rcd 14713, ¶ 53 (2015) (citing, e.g., *TMI Communications and Company, Limited Partnership and TerreStar Networks Inc., Application for Review and Request for Stay*, Memorandum Opinion and Order, 19 FCC Rcd 12603, 12604, ¶ 2 (2004); *PanAmSat Licensee Corp., Application for Authority to Construct, Launch, and Operate a Ka-Band Communications Satellite System in the Fixed-Satellite Service at Orbital Locations 58° W.L. and 125° W.L.*, Memorandum Opinion and Order, 16 FCC Rcd 11534, 11537-38, ¶ 12 (2001)).

waived these requirements, or extended the bond submission deadline until after the scheduled launch.⁴⁵ For these reasons, Inmarsat submits that waiver of the milestone and bond requirements is justified.

VII. Post-mission disposal and orbital debris mitigation

As mentioned above, I6-F2 operates under U.K. authority and is subject to the direct and effective oversight of the U.K. government. The U.K. Civil Aviation Authority, as the national licensing authority for space activities, is reviewing Inmarsat's plans for I6-F2 operation meet U.K. and international standards. Inmarsat will not launch I6-F2 until an Outer Space License is issued.

Inmarsat follows the Inter-Agency Space Debris Coordination Committee ("IADC") guidelines for end-of-life disposal by reserving sufficient propellant to deorbit I6-F2 to an appropriate disposal orbit above the GEO arc. For the duration of the I6-F2 lifetime, Inmarsat will follow the mitigation measures set forth in the IADC Space Debris Mitigation Guidelines.⁴⁶

VIII. Conclusion

For the foregoing reasons, Inmarsat requests authority for U.S. market access for I6-F2, to operate the Southbury Gateway with that spacecraft, and to add I6-F2 to the ISAT List.

⁴⁵ See, e.g., Stamp Grant, Momentus Space LLC, IBFS File No. SAT-LOA-20220504-00047, at condition 10 (granted Nov. 15, 2022) (granting in part waiver of the bond and milestone requirements due to the short timeframe between grant of the license and the planned launch date); Stamp Grant, New Skies Satellites B.V., Request for Extension of Time, File No. SAT-PPL-20110620-00112 (granted Apr. 4, 2012) (granting extension of deadline to post bond in light of upcoming satellite deployment after completing in-orbit testing); Stamp Grant, Intelsat North America LLC, Request for Extension of Time, File No. SAT-LOA-20100726-00167 (granted Dec. 16, 2010) (granting extension of deadline to post bond in light of upcoming satellite deployment after completing in-orbit testing).

⁴⁶ See Revision 3 of the IADC-02-01 Space Debris Guidelines, Inter-Agency Space Debris Coordination Committee (June 2021), https://iadc-home.org/documents_public/file_down/id/5249.

Respectfully submitted,

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