Exhibit A
Response to Questions 35 and 42
Section 25.137 Showing; Waivers

By this application, Inmarsat Hawaii Inc. ("Inmarsat Hawaii" and, together with its affiliates, "Inmarsat") seeks authority to operate a gateway earth station at Lino Lakes, Minnesota (the "Lino Lakes Gateway"), outside of Minneapolis. This earth station would communicate with the Inmarsat-5 F2 ("I5F2") spacecraft, which will be operated at the nominal 55º W.L. orbital location under the authority of the United Kingdom in the 27.5-30.0 GHz (Earth-to-space) and 17.7-20.2 GHz (space-to-Earth) bands. Because this spacecraft has not previously been approved for service to the United States, Inmarsat provides the requisite "market access" information in this exhibit, the enclosed Technical Annex, and the enclosed Schedule S, pursuant to Section 25.137 of the Commission's rules and the Commission's *Space Station Licensing Reform Order*.[1]

I. SERVICE DESCRIPTION AND PUBLIC INTEREST SHOWING

Inmarsat is a leading provider of L-band satellite services, and operates a global fleet of spacecraft, including some of the most advanced 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.

Traditionally, Inmarsat has focused on the provision of mobile satellite services ("MSS") using L-band spectrum. Inmarsat now plans to expand its service offerings in the U.S. using the I5F2 spacecraft, which will operate in the FSS and provide a suite of services which Inmarsat has branded "Global Xpress." Global Xpress will be the first global Ka-band satellite system and will provide end users significant improvements in throughput over existing L-band systems, at reduced cost. Through the use of efficient satellite design, the Global Xpress system will play a vital role in providing affordable high-data rate communications services that users increasingly demand—including broadband Internet access as well as multimedia, voice, and other data applications. The Global Xpress satellite system will be capable of providing service to users via a variety of both fixed and mobile terminals, but authority for user terminals is beyond the scope of this application and will be sought in a separate filing.

The I5F2 spacecraft provides close to 100 spot beams, yielding extremely high frequency re-use. The spacecraft also have steerable beams that can be deployed to accommodate peak traffic areas or used flexibly to support increased demand in emergency situations. In parallel with the development of the Global Xpress satellite technology, Inmarsat

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[1] *See Amendment of the Commission's Space Station Licensing Rules and Policies*, First Report and Order and Further Notice of Proposed Rulemaking, 18 FCC Rcd 10760, at ¶ 294 (2003) ("*Space Station Licensing Reform Order*").

has been engaged with network equipment, user terminal, and antenna manufacturers to develop an integrated communications solution, utilizing advanced modulation and coding schemes. The system was designed to utilize large segments of the Ka-band in a way that maximizes the spacecraft platform capacity.

The Global Xpress system takes advantage of existing network and equipment technologies, reducing the time to market and technology development risk. The rapid incubation and development time of the Global Xpress network allows Inmarsat to expedite deployment of these services to meet the exploding consumer demand for high-bandwidth services and applications with proven technology. Construction of the I5F2 satellite is already well underway, and it is expected to be launched in late 2013 or early 2014. The Inmarsat-5 satellites—three state-of-the-art Ka-band satellites—will form a constellation providing seamless global coverage, and are capable of delivering broadband speeds of up to 50 MB per second to fixed as well as mobile users. All capacity on the I5F2 spacecraft would be made available to Inmarsat's customers (including distributors who are independent of and those affiliated with Inmarsat) through individually negotiated contracts on a non-common carrier basis.[2] These customers, in turn, would use this capacity to serve end users on such terms and conditions as the customers may establish.

In addition to the benefits to end users of a new high-capacity broadband satellite service, the Global Xpress system is providing a significant boost to the U.S. economy by creating many high-tech jobs for manufacturers, service providers and users of the system. The three 702HP satellites that will be launched as part of the global constellation are being manufactured under a contract with Boeing, at its Satellite Development Center in El Segundo, California, the site of the world's largest satellite manufacturing center. Inmarsat has also partnered with Reston, Virginia-based launch services provider, International Launch Services ("ILS"), for the launch of the three Inmarsat-5 satellites. The launches, scheduled for 2013-14, will use the ILS Proton launch vehicle. Inmarsat has also partnered with Herndon, Virginia-based VT iDirect ("iDirect"), a world leader in satellite-based IP communications technology, to provide the ground network infrastructure and core module technology for integration into the satellite terminals for the Global Xpress service. Inmarsat is investing over $1.2 billion in the Global Xpress program, which includes satellite manufacturing, launch vehicle, insurance, terminal development and ground infrastructure costs, the major portion of which is being invested in the United States.

Inmarsat has announced partnerships with Phoenix, Arizona-based Honeywell and Concord, California-based SeaTel for the development of satellite terminals, and other U.S.-based suppliers will be announced in the future. Gogo, a leader of in-flight connectivity and pioneer of wireless in-flight digital entertainment solutions with several hundred employees in Itasca, Illinois and Broomfield, Colorado, has been named as a global commercial aviation launch partner for Global Xpress., In addition, Inmarsat has announced that it has signed a

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[2] *See Amendment to the Commission's Regulatory Policies Governing Domestic Fixed Satellites and Separate International Satellite Systems*, 11 FCC Rcd 2429, at ¶¶ 46-50 (1996) (no longer a need to require the provision of satellite capacity on a common carrier basis) ("*DISCO I*").

Memorandum of Understanding with southeast Florida-based GMPCS to appoint it as a Global Xpress partner in the broadcast media and enterprise markets. Other U.S. based partners are also expected to be named prior to service launch.

The Lino Lakes Gateway, managed and operated by Atlanta-, Georgia-based Encompass Digital Media, itself will require significant investment and will result in a high-tech facility in Minnesota, with an ongoing requirement for highly-trained engineering personnel to operate the gateway. Finally, Inmarsat has directly created a number of new high-paying, high-tech American jobs in the Global Xpress program since December 2010 as well as indirectly created positions at each of the manufacturers, suppliers, and service partners identified above. Inmarsat also has a number of existing employees in the United States, particularly focusing on the U.S. government sector, and many of these employees will in some way be involved in offering service via the Global Xpress system in the future. These jobs and those that will be created in the future are adding hundreds of millions of dollars directly and indirectly into the U.S. economy.

Global Xpress is designed to respond to the exponentially increasing demand for satellite-delivered broadband high-speed data that is available globally. A basic advantage of Global Xpress is that its terminals can be transported and used in either a fixed mode or while on the move, anywhere worldwide, due to the system's seamless global coverage. The technology and services offered by Global Xpress will stimulate growth and strengthen the U.S. economy by enabling U.S. companies to compete more efficiently in the global market. Global Xpress will also provide a diverse user community, including government, media, enterprise, and other end users, with increased flexibility and reliability in their communications options.

Global Xpress will facilitate applications related to critical infrastructure, disaster communications, telemedicine, e-learning, media coverage and other remote communications that will affect users' efficiency and quality of life in a positive way. The increase in demand for high-speed data is a reflection of the increasingly mobile, connected lives people live. Users want connectivity everywhere, anytime, especially for critical government and enterprise customers. Global Xpress satellite service will offer communications capabilities in areas where wired and wireless networks might not extend or provide adequate coverage. Therefore, it is particularly desirable for government, maritime (merchant, cruise, fishing), aeronautical users (business, transport, passenger connectivity) media and aid agencies.

Reliable, ubiquitous, and high-bandwidth communications is essential for ensuring that utilities (such as energy) and other parts of the critical infrastructure operate efficiently and dependably. Global Xpress will provide capabilities that will offer high-bandwidth, consistent communications cost-effectively in remote areas to fixed and mobile platforms. Advanced technologies, energy management and the smart grid are coming together very fast, and Global Xpress offers the means to knit these capabilities together wherever communications are required. The growth of an extensive digital communications network has made it practical to consider a more sophisticated type of smart grid, incorporating sensing, measurement and control devices with two-way communications to electricity, transmission, distribution and consumption parts of the power grid, even in remote locations. Global Xpress will improve the efficiency, reliability, and safety of power delivery and use in these new digital networks.

When it comes to mining and the oil and gas industry, reliable, cost-effective communications to fixed and mobile platforms is a must. Global Xpress technology will enable governments and businesses to have access to the latest communications services from even the most remote locations, whether from an off-shore oil platform or an oil exploration site located far from communications infrastructure. Exploration and drilling operations generate significant volumes of complex data that need to be transmitted in a timely fashion to decision-makers at the head office, and Global Xpress provides that capability. As these industries move to explore new prospects that are more remote, the need for an intelligent, flexible and high-performance communications infrastructure to support remote operations has become critical.

Communications is always a fundamental challenge during a disaster, and the ability to restore communications connections is one of the most urgent needs for disaster response and aid relief efforts. Global Xpress is especially well-suited to support emergency preparedness/disaster relief communications when terrestrial networks are unreliable or fail. In addition to providing high-bandwidth to affected users, it can provide backhaul to restore terrestrial communications (by backhauling communications from a pico cell, or providing IP connectivity for land mobile radio and mobile phones). High-bandwidth, reliable, ubiquitous communications is also essential to media users who are covering fast-breaking events, whether it is a tornado or other natural emergency, or some other media event.

Global Xpress satellite broadband will be able to support telemedicine services, e-learning and other applications that can improve the quality of life regardless of geography, while optimizing the use of available human and capital resources. The service can enable medical and health care expertise to be accessed by remote or under-served locations, and offer solutions for emergency medical assistance, enabling life-saving procedures and diagnostic tests in the field or long-distance consultations. It can also facilitate healthcare administration and logistics (*e.g.*, access to electronic medical records), the delivery of primary and special care in rural communities, and supervision, quality assurance and training for health-care professionals and providers. Global Xpress will offer the potential to significantly improve the effectiveness of remote healthcare by enabling more accurate and timely medical record-keeping and data sharing, and reducing health costs overall.

In the education context, Global Xpress will be able to support e-learning capabilities for communities in remote locations that might not otherwise have access to reliable communications connections. Universities and other educational institutions are increasingly offering online courses, but there are still many users that do not have access to a reliable means of accessing the Internet because they are located in a remote area, or change locations frequently. Global Xpress can offer these students a means of continuing their education by providing a consistent, reliable connection, which is available no matter where they are located.

In summary, the proposed Lino Lakes Gateway will be a critical part of a system that will advance the Commission's goals of enhancing competition and promoting the growth and 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 advance the objectives of the *National Broadband Plan* by expanding access to wireless broadband services, making innovative and efficient use and reuse of spectrum, especially in remote areas. The Global Xpress system is already creating new high-paying jobs in the

communications sector. Accordingly, granting this application will serve the public interest, convenience, and necessity.

II. *DISCO II* SHOWING (SECTION 25.137(A))

The I5F2 spacecraft will be operated at the nominal 55º W.L. orbital location under the authority of the United Kingdom.[3] Consequently, the Commission's *DISCO II* framework applies to this application.[4] 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.[5] Each of these factors weighs in favor of granting this application.

A. Effect on Competition in the United States

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

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3 The United Kingdom has submitted on behalf of Inmarsat an ITU filing under the filing name INMARSAT-KA 55W, as published by the ITU in IFIC 2669 (CR/C/2558) on May 18, 2010 (date of receipt January 15, 2010). *See* Ofcom Letter, attached as Exhibit I. This United Kingdom ITU filing covers frequency bands for which authority is sought in this application, as well as portions of the C-band for which authority is not sought in this application. *See* Technical Annex at A.2. As is customary in the UK, Inmarsat will seek authority under the United Kingdom Outer Space Act from the UK Space Agency for the INMARSAT-KA55W spacecraft in the future, closer to its launch. Sufficient ties with the United Kingdom exist to provide the UK Space Agency the basis for issuing an authorization, because of the procurement of the spacecraft's launch through an Inmarsat entity based in the UK, and because an Inmarsat-based UK company will be responsible for in-orbit activities.

As explained in the Technical Annex, the spacecraft also will include the capability of communicating in certain beams in the 20.2-21.2 GHz and 30.0-31.0 GHz bands, which are not allocated for commercial service in the United States and for which authority is not sought in this application. *See, e.g., Establishment of Policies and Service Rules for the Mobile Satellite Service in the 2 GHz Band, Report and Order*, 15 FCC Rcd 16127, at ¶ 88 (2000).Operations in those bands would occur under the authority of Norway, pursuant to ITU filings submitted by the Norwegian Administration. Inmarsat acknowledges that it or one of its customers would need to obtain separate authority prior to initiating U.S. service in those bands.

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, at ¶¶ 30-49 (1997) ("*DISCO II*").

5 *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, at ¶ 6 (2002).

Telecommunications Agreement.[6] 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.[7] Accordingly, the presumption in favor of entry applies to the I5F2 spacecraft.

Allowing Inmarsat to serve the U.S. with the I5F2 spacecraft would help fulfill the promise of the WTO Basic Telecommunications Agreement with respect to satellite communications services. As described above in greater detail, grant of this application 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. The Commission consistently has relied on these same public interest benefits in granting similar requests.[8]

B. Spectrum Availability

As noted above, the I5F2 spacecraft would serve the United States using portions of the Ka-band from the nominal 55º W.L. orbital location. More specifically, the Lino Lakes Gateway would communicate with the I5F2 spacecraft using the 27.5-30.0 GHz (Earth-to-space) and 17.7-20.2 GHz (space-to-Earth) bands.[9] No other satellite operates in these frequencies within two degrees of 55º W.L.

As Inmarsat demonstrates in the attached Technical Annex, Inmarsat's proposed operations would be fully compliant with the Commission's two-degree spacing requirements, would not cause harmful interference to any other authorized user of the spectrum, and would be compatible with future Ka-band assignments that are consistent with the Commission's rules. Therefore, the instant application is fully consistent with the procedures set forth by the Commission in the *Space Station Licensing Reform Order* regarding the processing of GSO-like

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

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

8 *See, e.g., Digital Broadband Applications Corp.*, 18 FCC Rcd 9455 (2003); *Pegasus Development Corp.*, 19 FCC Rcd 6080 (2004); *DIRECTV Enterprises, LLC, Request for Special Temporary Authority for the DIRECTV 5 Satellite*, 19 FCC Rcd 15529 (2004).

9 The design of I5F2 spacecraft supports service to user terminals located in the United States in the narrower 29.0-30.0 GHz (Earth-to-space) and 19.2-20.2 GHz (space-to-Earth) band segments. Such operations are not the subject of the instant application. Inmarsat acknowledges that it or one of its customers would need to obtain separate authority for such user terminals. Inmarsat also acknowledges that it potentially may be necessary to employ suitable sharing techniques to ensure the compatibility of user terminals in certain bands with other licensed operations. Such showings are beyond the scope of this application. *See, e.g., Teledesic LLC Minor Modification of License to Construct, Launch and Operate a Non-Geostationary Fixed Satellite Service System*, 14 FCC Rcd 2261, at ¶¶ 19, 22 (1999).

services.[10] As detailed below, Inmarsat respectfully requests waivers of the Commission's Ka-band frequency plan and Section 2.106 of the Commission's rules to use certain frequency bands to serve the United States market. Inmarsat has coordinated the proposed gateway earth station with terrestrial licensees in the 17.7-19.7 GHz band, as demonstrated in Exhibit B, and in the 27.5-29.5 GHz band, as demonstrated in Exhibit C.

1. Primary GSO FSS Allocations

The 18.3-18.8 GHz, 19.7-20.2 GHz, 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. The proposed communications over the I5F2 spacecraft comply with the uplink off-axis EIRP density and downlink PFD levels specified in Section 25.138 of the Commission rules.[11] Therefore, the proposed use of these frequencies is compatible with adjacent satellite systems.

Consistent with Section 25.258 of the Commission's rules, Inmarsat will coordinate with operators of NGSO MSS feeder link earth stations for which the 29.25-29.5 GHz band is allocated on a co-primary basis. The Technical Annex contains a demonstration that the proposed operations will not adversely affect the NGSO MSS feeder link operations that are currently licensed by the Commission.

In the 29.25-29.5 GHz band, a limited number of grandfathered, terrestrial point-to-point licensees remain.[12] Such operations may be conducted on a temporary basis for back-up operations when wireline services are unavailable.[13] The Commission retained co-primary status for these FS operations and required FSS licensees to "work out private business arrangements . . . to protect those co-primary microwave operations."[14] Inmarsat has coordinated the proposed operation of the Lino Lakes Gateway with potentially affected grandfathered FS licensees. A copy of the frequency coordination report is attached hereto as Exhibit C.

2. Secondary GSO FSS Allocations

a. 27.5-28.35 GHz (Uplink)

The 27.5-28.35 GHz band is allocated to the LMDS on a primary basis and the GSO FSS on a secondary basis. The proposed use of this band for communications over the

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10 *See Space Station Licensing Reform Order* at ¶ 113.

11 47 C.F.R. § 25.138.

12 *See* 47 C.F.R. §§ 101.31(a)(i), 101.103(d) (grandfathering terrestrial operations authorized under 47 C.F.R. § 21.708 (1995)); *see also Request to Exclude the 28.35-29.1 GHz and 29.25-29.5 GHz Band Segments from Included Frequencies on the Renewal of Licenses*, DA 11-1650, at ¶ 4 (rel. Sept. 30, 2011) ("*Hughes/DIRECTV Request Order*").

13 *See* 47 C.F.R. §§ 21.706(d), 21.707(a) (1995).

14 *Hughes/DIRECTV Request Order* ¶ 10.

Lino Lakes Gateway is consistent with the designation of this portion of the band for GSO FSS gateway-type services.[15]

Inmarsat has commissioned a study of LMDS operations in the vicinity of the Lino Lakes Gateway, which concluded that there currently is only one licensee. That licensee has indicated that it does not object to the deployment of the proposed gateway on a secondary basis. A copy of the frequency coordination report is attached hereto as Exhibit C.

As demonstrated in the Technical Analysis, the uplink operations of the Lino Lakes Gateway would be unlikely to cause harmful interference into any future LMDS stations. Many areas to the south-east of the planned gateway site (*i.e.*, the direction toward the 55º W.L. orbital location) have very low population densities and contain several lakes, and are not likely locations for LMDS system deployment. Further, Inmarsat would employ interference mitigation techniques, such as shielding, as necessary to avoid interference into any LMDS stations that may be deployed. The Commission previously has authorized secondary gateway operations in this band on the basis of similar showings of likely compatibility with LMDS operations.[16]

Consistent with the secondary nature of the GSO FSS allocation in this band, Inmarsat acknowledges that its operations in the 28.1-28.35 GHz band would not be protected from harmful interference from LMDS, and that transmissions from its earth station in the 28.1-28.35 GHz band would need to cease in the event of harmful interference into LMDS operations.

b. 28.6-29.1 GHz (Uplink)

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. The Technical Annex contains a quantitative demonstration of how Inmarsat would protect NGSO FSS systems in the 28.6-29.1 GHz band from harmful interference. As explained therein, the earth stations associated with the I5F2 spacecraft would maintain a minimum angular separation to ensure that interference does not occur into NGSO networks in the band. Inmarsat is finalizing a frequency coordination agreement with O3b Limited, which currently is the only NGSO network that has sought authorization to serve the U.S. in this band. Inmarsat will also coordinate with any future NGSO

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15 *See Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, To Reallocate the 29.5-30.0 GHz Frequency Band, To Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services*, 11 FCC Rcd 19005, at ¶ 45 (1996) ("*28 GHz First Report and Order*") ("At 27.5-28.35 GHz we designate 850 MHz for LMDS on a primary basis. GSO/FSS . . . will be permitted on a non-interference basis . . . for the purpose of providing limited gateway-type services.").

16 *See, e.g.,* Amended Letter of Intent of ViaSat, Inc., IBFS File No. SAT-AMD-20080623-00131 (granted Aug. 18, 2009) ("ViaSat LOI"); *see also* ViaSat Earth Station IBFS File No. SES-LIC-20110211-00150, as amended, Call Sign E110015 (granted Oct. 21, 2011).

operators in this band to determine the minimum angular separation required to protect such future systems.

Notwithstanding the minimal risk of harmful interference into NGSO FSS operations, communications associated with the I5F2 spacecraft in the 28.6-29.1 GHz band would cease in the event of harmful interference into NGSO operations, consistent with the secondary status of GSO FSS in the band. During in-line events between NGSO operations, and the I5F2 spacecraft and its associated earth stations, if required, Inmarsat would cease transmissions in this band from the relevant beam of the I5F2 satellite or its associated earth station, as required, to avoid interference. Correspondingly, the I5F2 network would accept interference from NGSO FSS operations in this band segment.

3. Waiver Requests for Non-Conforming Uses

The 17.7-18.3 GHz, 18.8-19.3 GHz, 19.3-19.7 GHz and 29.1-29.25 GHz bands are not allocated to the GSO FSS on either a primary or secondary basis. Accordingly, Inmarsat requests waivers of the United States Table of Frequency Allocations, as codified in Section 2.106 of the Commission's rules,[17] to permit the Lino Lakes Gateway to communicate with the I5F2 spacecraft using these bands on a non-conforming basis. The Commission has granted waivers for non-conforming spectrum uses where a demonstration is made that the non-conforming operations would not likely cause harmful interference into the services allocated in Section 2.106 and where the non-conforming operator accepts any interference from conforming spectrum users.[18]

"Good cause" exists for the Commission to grant the requested waivers.[19] As an initial matter, such grant "would better serve the public interest than strict adherence to the general rule,"[20] 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 I above.

Grant of the requested waivers also would allow Inmarsat to introduce advanced satellite technologies that would make more efficient use of frequency bands that currently are underutilized. 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 I5 satellite constellation relies on use of the full range of the Ka-band frequencies allocated to the FSS on an international basis in order to satisfy the expanded capacity requirements necessary for the cost-effective satellite broadband services

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17 47 C.F.R. § 2.106.

18 *See, e.g., contactMEO Communications*, LLC, 21 FCC Rcd 4035, at ¶ 34 (2006) ("*AtContact Order*"); *Northrop Grumman Space & Mission Systems Corp.*, 24 FCC Rcd 2330, at ¶¶ 76, 90 (2009) ("*Northrop Grumman Order*"); *Hughes Network Systems, LLC*, 26 FCC Rcd 8521, at ¶ 13 (2011).

19 *See* 47 C.F.R. § 1.3.

20 *See WAIT Radio v. FCC*, 418 F.2d 1153, 1157 (D.C. Cir. 1969).

that Inmarsat seeks to offer. This will especially facilitate the provision of service to users that will benefit from global availability of the Global Xpress service, such as the U.S. government. The use of contiguous frequency bands simplifies the design of user and gateway equipment, and will result in lower-cost equipment, which ultimately will reduce the cost of service to end users. All satellites in the constellation must operate on these same, contiguous frequency bands in order to function effectively. Grant of the requested waivers thus would ensure that users will have access to cost-effective, innovative and ubiquitously-available advanced satellite services using the I5 constellation not only in the United States, but also worldwide.

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."[21] 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 demonstrated in the Technical Annex, Inmarsat does not expect that any such primary or secondary operations would impede Inmarsat's proposed operations. However, Inmarsat also would accept any harmful interference into its operations caused by primary and secondary uses. The subsequent sections address the primary and secondary allocations in each of the band segments identified above, and explain how Inmarsat would operate on a non-conforming, non-harmful-interference basis in each such band segment.

a. 17.7-18.3 GHz

The 17.7-18.3 GHz band is allocated on a primary basis to the terrestrial fixed service ("FS"). In the United States, the 17.7-17.8 GHz band also is allocated to the FSS on a co-primary basis, but this FSS allocation is limited by footnote US271 to broadcasting-satellite service ("BSS" or "DBS") feeder links in the Earth-to-space direction.[22] Inmarsat requests a waiver of Section 2.106 to permit downlink operations from the I5F2 spacecraft in the 17.7-18.3 GHz band on a non-conforming, non-interference basis. As a non-conforming user of this frequency band, Inmarsat would cease operations in the affected frequencies in the event of any harmful interference into any FS or DBS operations (as discussed below), and Inmarsat would accept interference from FS or DBS operations in this band segment.

1. Terrestrial Fixed Service

As demonstrated in the Technical Annex, downlinks from the I5F2 spacecraft would not cause harmful interference into FS operations. Indeed, Inmarsat's downlinks in this band would meet the power-flux density ("PFD") limits at the earth's surface set forth in the Commission's rules[23] and in Article 21 of the ITU Radio Regulations (which is applicable to the

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21 *Northeast Cellular Tel. Co. v. FCC*, 897 F.2d 1166 (D.C. Cir. 1990); *see also Fugro-Chance, Inc.*, 10 FCC Rcd 2860, at ¶ 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.").

22 47 C.F.R. § 2.106 n.US271.

23 47 C.F.R. § 25.208(c).

international allocation for FSS operations in Region 2).[24] The PFD limits prescribed by the ITU were established to protect terrestrial services in the 17.7-18.3 GHz band, and the existence of the spectrum uses permitted by ITU radio regulations dictate that FS licensees anticipate the need to operate in an environment that includes satellite downlinks at corresponding PFD levels.[25] In particular, the potential always exists for FSS systems that are deployed to serve Canada, Mexico, or the Atlantic or Pacific Oceans to have "spill-over" coverage of the United States. FS systems also should be designed to withstand the downlink power levels of U.S. government FSS systems that transmit within the 17.8-21.2 GHz band and which are specified in the relevant ITU filings as being able to operate at power levels that are approximately 6 dB higher than the power levels from I5F2 downlinks. Thus, Inmarsat's proposed operations in this band would not appreciably change the operating environment for FS receivers.

In addition, based on a hypothetical worst-case analysis of an FS receiver located in a region of the U.S. where the elevation angles of the I5F2 downlinks are the lowest and where the FS receiver station is pointed in the azimuth direction toward the I5F2 satellite, the downlink power levels from I5F2 would not cause harmful interference into such an FS receiver. As demonstrated in the Technical Annex, the potential for any FS receiver to be pointed directly at the I5F2 spacecraft—and thus experience harmful interference notwithstanding Inmarsat's compliance with the PFD limits—would be extremely limited. However, if this unlikely situation were to occur, Inmarsat could cease operations on the offending carrier in the beam at issue, or otherwise reduce the power into the affected FS receiver, to mitigate harmful interference.

2. DBS/BSS

As demonstrated in the Technical Annex, downlinks from the I5F2 spacecraft in this band would not cause harmful interference into adjacent DBS spacecraft. The off-axis PFD of the I5F2 spacecraft downlinks would be significantly lower than the levels triggering a coordination requirement for a DBS satellite located at 61.5º W.L., which is the nearest U.S. DBS Region 2 Plan orbital location to the I5F2 spacecraft at 55º W.L.

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24 ITU Radio Regulations, Article 21, Table 21-4.

25 By way of illustration, in adopting PFD limits in 17.7-17.8 GHz band, the Commission recognized that the footprint of satellite beams serving nearby Region 2 countries could illuminate portions of the United States. *Establishment of Policies and Service Rules for the Broadcasting-Satellite Service at the 17.3-17.7 GHz Frequency Band and at the 17.7-17.8 GHz Frequency Band Internationally, and at the 24.75-25.25 GHz Frequency Band for Fixed Satellite Services Providing Feeder Links to the Broadcasting-Satellite Service and for the Satellite Services Operating Bi-directionally in the 17.3-17.8 GHz Frequency Band*, 22 FCC Rcd 8842 ¶ 55 (2007). Thus, FS users should construct and operate their systems in a manner that can withstand satellite downlinks operating within these PFD limits.

In addition, such downlinks from the I5F2 spacecraft would be unlikely to cause harmful interference into the reception of downlinks outside the United States from U.S.-licensed BSS spacecraft operating at nearby orbital locations.[26]

b. **18.8-19.3 GHz**

The 18.8-19.3 GHz band is allocated for NGSO FSS operations on a primary basis.[27] As demonstrated in the Technical Annex, and discussed above with respect to the 28.6-29.1 GHz band, the I5F2 spacecraft would be able to operate in the 18.8-19.3 GHz band while protecting NGSO users. The Commission has permitted GSO FSS operations in the 18.8-19.3 GHz band where an operator has established its ability to operate on a non-interference basis.[28] As a non-conforming user of this frequency band, Inmarsat would cease operations in the 18.8-19.3 GHz band in the event of any harmful interference into any NGSO FSS operations, and Inmarsat would accept interference from NGSO FSS operations in this band segment.

c. **19.3-19.7 GHz**

The 19.3-19.7 GHz band is allocated on a co-primary basis to the FS and MSS feeder links. As demonstrated in the Technical Annex, and for the reasons discussed above with respect to the 17.7-18.3 GHz band, Inmarsat's operations in the 19.3-19.7 GHz band segment would be unlikely to cause harmful interference into FS operations, and also can be expected to operate without suffering harmful interference.

Nor would Inmarsat's operations in this band cause harmful interference into MSS feeder link operations. When the Commission adopted the Ka-band band plan and MSS feeder link designation, it contemplated the shared use of the band by multiple MSS systems. Over 15 years later, however, only one MSS satellite system is using the 19.3-19.7 GHz band and the associated 29.1-29.5 GHz band (discussed below). Therefore, the Technical Annex provides an analysis of Inmarsat's proposed operations with respect to Iridium's MSS feeder link operations. As demonstrated by that analysis, gateway spot beams from the I5F2 spacecraft would not impact Iridium's feeder link facilities in Alaska, Arizona, or Hawaii, which would be located hundreds of miles from the Lino Links Gateway. In addition, interference into future MSS feeder link stations in this band is highly unlikely given that MSS operators will need to ensure adequate geographic isolation to coordinate with co-primary GSO FSS operations in the 29.25-29.5 GHz band, which is likely to be used in conjunction with MSS feeder link spectrum in the 19.3-19.7 GHz and 29.1-29.25 GHz bands.[29] Given the increasing bandwidth requirements of communications services generally, MSS operators can be expected to require shared use of most, if not all, of the Ka-band frequencies designated for MSS feeder link

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[26] The 17.7-17.8 GHz band has an international allocation in Region 2 for BSS in the space-to-Earth direction.

[27] *See* 47 C.F.R. § 2.106 & n.NG165.

[28] *See* ViaSat LOI.

[29] *See* Iridium Feeder Link Licenses, Call Signs E960131, E050282, E060300.

operations.[30] Further, Inmarsat has reached out to Iridium and will coordinate the proposed operations with them.

As a non-conforming user of this frequency band, Inmarsat would cease operations in the affected frequencies in the event of any harmful interference into any MSS feeder link or FS operations (as discussed above), and Inmarsat would accept interference from MSS or FS operations in this band segment.

d. **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 Lino Lakes Gateway has indicated that it does not object to Inmarsat's proposed secondary deployment in this band.[31] 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. As demonstrated in the Technical Annex and discussed above with respect to the 27.5-28.35 GHz band, the Lino Lakes 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.

Nor would Inmarsat's proposed operations cause harmful interference into MSS feeder link operations. As demonstrated in the Technical Annex and discussed above in connection with the 19.3-19.7 GHz band, 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.

4. U.S. Government Coordination

Inmarsat will engage 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 will conduct US334 coordination with the applicable Federal users in advance. In accordance with Section 25.130(f), the half-power beam width of the antenna downlink is 0.08 degrees at 19 GHz.

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30 *See, e.g.*, IBFS File Nos. SES-MOD-20120223-00196; SES-AMD-20120326-00300 (Call Sign E980049).

31 *See* Exhibit C, 28 GHz Frequency Coordination Report.

C. 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 (DOJ) and the Department of Homeland Security (DHS) on the other, dated September 23, 2008, as amended.

III. LEGAL AND TECHNICAL INFORMATION (SECTION 25.137(B))

A. Legal Qualifications

Inmarsat's legal qualifications are set forth in this Exhibit A and in the associated Form 312. In addition, this Exhibit A, the associated Technical Annex and Form 312 demonstrate Inmarsat's satisfaction of the applicable requirements for space station applicants set forth in Section 25.114 of the Commission's rules.[32]

B. Technical Qualifications

Included with this application are a Technical Annex (including an orbital debris mitigation showing) and Schedule S for the I5F2 spacecraft with the required Part 25 technical information. The radiation hazard analysis for the Lino Lakes Gateway antenna is included as Exhibit H.

IV. ADDITIONAL REQUIREMENTS (SECTION 25.137(D))

A. Milestones and Bond Requirement

Inmarsat plans to implement the I5F2 spacecraft in compliance with the Commission's milestones established in the *Satellite Licensing Reform Order*.[33] Because the I5F2 spacecraft has not yet been launched, it will be subject to the bond requirement for GSO satellites. The spacecraft is already under contract, has completed CDR, and construction has commenced. Thus, Inmarsat anticipates being required only to post that portion of the bond that secures the fourth and final milestone.

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32 *See* 47 C.F.R. § 25.114.

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

B. Reporting Requirements

Inmarsat will comply with all applicable reporting requirements for the I5F2 spacecraft.

C. Spectrum Usage

Inmarsat currently has pending an application seeking market access from the nominal 97º W.L. orbital location, as well as two duplicate applications for that location that remain in the queue.[34] These duplicate applications in the queue should not be considered to be separate requests for market access. Nonetheless, even if these two duplicate applications are counted, Inmarsat does not exceed the limit on pending applications in the Ka-band in Section 25.137(d)(5). 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.

D. Ownership Information

Inmarsat Hawaii, a Hawaii corporation with its principal place of business in the United States, is wholly owned by Inmarsat U.S. Holdings, Inc., a Delaware corporation with its principal place of business in the United States. Inmarsat U.S. Holdings, Inc. is wholly owned by Inmarsat Services Ltd. Inmarsat Services Ltd. is wholly owned by Inmarsat Ventures Ltd. Inmarsat Ventures Ltd. is wholly owned by Inmarsat Investments Ltd. Inmarsat Investments Ltd. is wholly owned by Inmarsat Group Ltd. Inmarsat Group Ltd. is wholly owned by Inmarsat Holding Ltd. Inmarsat Holding Ltd. is wholly owned by Inmarsat plc. Inmarsat plc is a widely-held public company. The only 10 percent or greater owner of Inmarsat plc is Landsdown Partners Limited ("Landsdown"), an investment company formed under the laws of the United Kingdom. Landsdown holds approximately a 14 percent interest and has its principal place of business at 15 Davies Street, London, UK W1K 3AG. With the exception of Inmarsat Hawaii and Inmarsat U.S. Holdings, Inc., each of the Inmarsat entities described above is formed under the laws of England and Wales and has its principal place of business in the United Kingdom.

The officers and directors of Inmarsat Hawaii are as follows:

Name	Position(s)	Citizenship
Diane Cornell	Director and President	United States
Perry Melton	Director	United States
Leo Mondale	Director	United States
Alison Horrocks	Secretary/Treasurer	United Kingdom

Each of these officers and directors can be reached care of Inmarsat at 1101 Connecticut Avenue, NW, Suite 1200, Washington, DC 20036.

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[34] *See* IBFS File Nos. SAT-LOI-20110809-00150; SAT-LOI-20110809-00153; SAT-LOI-20110809-00157.

V. TECHNICAL WAIVER REQUESTS

In addition to the waivers of Section 2.106 above, Inmarsat requests the following technical waivers in connection with this application.

A. Limited Waiver of 25.202(g)

As described in the attached Technical Annex, the I5F2 spacecraft will conduct telecommand operations at 29.494 and at 29.468 GHz. These operations would lie at the edge of the 29.25-29.5 GHz band segment specified in the Commission's Ka-band band plan.[35] However, Inmarsat acknowledges that the Commission has not specified exactly what constitutes the "band edge" for purposes of Section 25.202(g). Accordingly, to the extent necessary Inmarsat requests a limited waiver of Section 25.202(g) to allow it to operate its telecommand carriers at the stated frequencies.

Locating the telecommand carriers 6 MHz and 32 MHz, respectively, from the edge of the 29.25-29.5 GHz band would not frustrate the purpose of Section 25.202(g), which is to promote efficient use of spectrum and to prevent interference with adjacent users. The telecommand carrier at 29.468 GHz is located as close as possible to the adjacent transponder in the 29.25-29.5 GHz band segment.

Notably, the uplink PSD of the telecommand carrier would not exceed that of communications carriers on the I5F2 spacecraft, and would be consistent with Section 25.138. Because the telecommand operations would cause no more interference to neighboring systems as compared to communication carriers, the precise location of these carriers should not be a material consideration for purposes of Section 25.202(g). In sum, granting a waiver of Section 25.202(g) is appropriate because the proposed operations would neither increase the potential for harmful interference, nor decrease Inmarsat's ability to use spectrum efficiently.

B. Limited Waiver of Section 25.138(d)

Inmarsat seeks a limited waiver of Section 25.138(d), which requires applicants to provide in a Ka-band earth station application a series of radiation patterns measured on a production antenna performed on a calibrated antenna range provided in the application to certain specifications.[36] Inmarsat is including as Exhibit D exemplary antenna patterns produced by the antenna manufacturer for this type of antenna, which demonstrate that this antenna type complies with the performance requirements of Section 25.209. As the Technical Annex reflects, the off-axis EIRP density limits of Section 25.138(a) are equivalent to a maximum uplink input power density of -56.5 dBW/Hz for earth stations in compliance with the off-axis transmit gain masks in Section 25.209(a).[37] Because the uplink input power density of the Lino Lakes Gateway antenna is -70.0 dBW/Hz and the antenna complies with the masks in Section

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35 *See 28 GHz First Report and Order* ¶ 72 (designating co-primary usage of the 29.25-29.5 GHz band for MSS feeder links and GSO FSS systems).

36 *See* 47 C.F.R. § 25.138(d).

37 *See* Attachment A, Technical Annex at A.11.1.

25.209, compliance with Section 25.138(a) is ensured. However, because these sample patterns: (i) are not based on actual measurements of a sample antenna, (ii) do not include elevation plane patterns, (iii) do not include patterns at the middle of the frequency range, or (iv) main beam patterns plotted to 10 degrees, Inmarsat requests a partial waiver of Section 25.138(d) in these respects.

Section 25.138 was intended to address blanket licensing of relatively small, mass produced antennas, and thus requires a range of measurement parameters to account for the wide range of installation possibilities. The gateway antenna that is the subject of this application has a diameter of 13.2 meters and will be constructed on-site. Strict application of these antenna pattern requirements is unnecessary because the antenna will be meticulously constructed and mechanically aligned on-site before testing begins. Verification testing will occur on site on the actual antenna (not a production antenna). Thus, a partial waiver of Section 25.138(d) is warranted because it can be fully assured that the overall performance of the gateway antenna will meet or exceed the requirements of Section 25.138.

C. Limited Waiver of Section 25.114(c)

Inmarsat understands that it is currently not feasible to embed in the Schedule S form the large number of GXT files that Inmarsat is providing with this application.[38] Accordingly, Inmarsat is instead: (i) e-mailing these files to IBFSINFO@fcc.gov, pursuant to instructions provided on FCC Form 312; and (ii) filing these GXT files as an attachment to the application, in ZIP format. Inmarsat requests a waiver of the requirement in Section 25.114(c) of the Commission's rules, which requires certain information to be filed in the Schedule S, and any other rule waiver necessary to permit the submission of the GXT files in this alternative manner.

VI. WAIVER PURSUANT TO SECTION 304 OF THE COMMUNICATIONS ACT

In accordance with Section 304 of the Communications Act of 1934, as amended, Inmarsat hereby waives any claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise.

VII. CONCLUSION

For the foregoing reasons, granting Inmarsat's request to operate the Lino Lakes Gateway and for U.S. market access for a Ka-band satellite operated under the authority of the United Kingdom at the nominal 55° W.L. location will serve the public interest, convenience and necessity. Inmarsat respectfully requests that the Commission promptly grant this application.

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[38] *See* Application of SkyTerra Communications, Inc., IBFS File No. SAT-LOA-20050214-00038, Attachment A at 34 (granted Apr. 19, 2005).

LIST OF EXHIBITS AND ATTACHMENTS

Attachment A Technical Annex

Exhibit A Narrative (Response to Questions 35 and 42; Section 137 Showing; Waivers)

Exhibit B 18 GHz Frequency Coordination Report

Exhibit C 28 GHz Frequency Coordination Report

Exhibit D Antenna Patterns

Exhibit E Response to Question 36

Exhibit F Response to Question E17

Exhibit G Response to Question E20

Exhibit H Radiation Hazard Analysis

Exhibit I Ofcom Letter