FCC Form 312
IBFS File Nos. SAT-MOD-20131227-00148
SAT-AMD-_____-_____
Call Sign: S2110

Legal Narrative and Public Interest Statement

Harris VHF Payload Hosted on Iridium NEXT

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Iridium Constellation LLC ("Iridium") hereby amends its application for authority to launch and operate its second generation constellation, Iridium NEXT.[1] This amendment supplements the Iridium NEXT application to provide additional information regarding a receive-only hosted payload.[2] The remaining information provided in Iridium's pending application is unchanged and is incorporated by reference.[3]

I. AMENDMENT

This amendment seeks authority for some of the Iridium NEXT satellites[4] to include a hosted payload developed by Harris Corporation ("Harris") that is capable of receiving across the 156.0125-162.0375 MHz maritime VHF band (the "VHF Hosted Payload"). As explained in

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1 *See* Iridium Constellation LLC, Application for Modification of NGSO Mobile Satellite Service System Authorization (S2110) To Launch and Operate Replacement Satellites, IBFS File No. SAT-MOD-20131227-00148 (filed Dec. 27, 2013).

2 *See* Letters from Jennifer D. Hindin, Counsel to Iridium to Marlene H. Dortch, Secretary, Federal Communications Commission, IBFS File No. SAT-MOD-20131227-00148 (filed July 22, 2015 and October 31, 2014 (providing information on the hosted payload)).

3 Since the filing of the Iridium NEXT application in 2013, the Part 25 rules governing the information required for space station applications have changed. Comprehensive Review of Licensing and Operating Rules for Satellite Services, IB Docket No. 12-267, *Report and Order*, 25 FCC Rcd 12403 (2013); *see also* International Bureau Adopts Policy of Granting Interim Waiver of Certain Requirements for Space Station Applications, Report No. SPB-255, *Public Notice*, 29 FCC Rcd 664 (2014). Accordingly, this amendment includes new and supplemental information only related to the VHF Hosted Payload and only to the extent required under current Commission rules and policy.

4 The VHF Hosted Payload will be included on 65 Iridium NEXT satellites: 56 of the initial satellites in mission orbit, 4 in-orbit spares, and 5 ground spares. The exact number of mission orbit satellites operating with the VHF Hosted Payload may increase or decrease should initial mission satellites fail, in-orbit spares be activated, or ground spares be launched and activated. The first two Iridium NEXT satellites scheduled for launch in December 2015 will not contain the VHF Hosted Payload.

the attached Engineering Statement Supplement, Iridium seeks authority at this time to receive signals only over the following channels: [5]

161.975 MHz "AIS 1"
162.025 MHz "AIS 2"
161.950 MHz "ASM 1"
162.000 MHz "ASM 2"
156.775 MHz "Long Range AIS 1" or "AIS 3"
156.825 MHz "Long Range AIS 2" or "AIS 4"
156.525 MHz "DSC-R", and
156.8 MHz maritime mobile distress channels.

The VHF Hosted Payload will receive signals on these maritime VHF channels from existing ship-based transmitters. The data received from these separately authorized signals will be transported across the Iridium system and downlinked to an Iridium earth station using the same inter-satellite links and feeder links as indicated in the Iridium NEXT application. When the mission data is received at the Hosted Payload Operations Center (co-located at the Iridium Satellite Network Operations Center in Leesburg, Virginia), it will be transported terrestrially by a Virtual Private Network ("VPN") connection to a Harris facility in Melbourne, FL for subsequent processing and delivery to Harris' customers.

As shown below, authorizing the VHF Hosted Payload to receive data over the indicated channels would serve the public interest by enabling the deployment of a robust VHF Automatic Identification System ("AIS") and maritime domain awareness system that will provide critical safety and situational awareness data to the U.S. and International Coast Guards, governments, and commercial entities. Moreover, operation of the VHF Hosted Payload poses no risk of additional interference because Iridium seeks authority only to receive transmissions from existing stations on these additional frequencies—no new dedicated earth stations will be

[5] Each of these channels is 25 kHz wide with the indicated frequency as the center frequency. Throughout this narrative, the channels will continue to be referred to by center frequency.

authorized, and there will be no additional transmissions from the satellite besides those otherwise addressed in the Iridium NEXT application.

II. GRANT OF THE AMENDMENT SERVES THE PUBLIC INTEREST

Grant of the Iridium NEXT application, as amended, will serve the public interest by facilitating a generational leap in satellite-based maritime domain awareness. AIS technology already is deployed aboard all large vessels and many smaller vessels around the globe. Satellite AIS has the potential to provide a complete and global picture of the world's maritime shipping environment, but existing systems have not fully realized this vision. To provide a full view of the maritime domain, Harris has partnered with Iridium to provide real-time global maritime domain tracking and information solutions. The VHF Hosted Payload receiver system on Iridium NEXT is a key element in an end-to-end maritime domain awareness capability for the commercial marketplace as well as governments around the world. It will take advantage of recent technological and regulatory advances and those that are foreseeable both on the near-term horizon and in the future.

AIS transponders automatically broadcast information, such as ship position, course, speed, rate of turn, and navigational status, at regular intervals via a maritime VHF transponder. Much of the information originates from the ship's navigational sensors, typically its Global Navigation Satellite System ("GNSS") receiver and gyrocompass. Other information, such as the Maritime Mobile Service Identifier ("MMSI"), vessel name, and VHF radio call sign, are programmed when the equipment is installed and are transmitted regularly as part of AIS messages. Received AIS information can be displayed on a ship's situational awareness displays (*e.g.*, radar, chart, plotter) to show other vessels' positions and call sign information, and the AIS information augments these systems to improve safety of navigation worldwide.

Since 2004, the International Maritime Organization ("IMO") has required AIS transponders to be aboard certain vessels. Under the provisions of the Safety of Life at Sea ("SOLAS") Conventions, ships of 300 gross tonnage and upwards engaged on international voyages, cargo ships of 500 gross tonnage and upwards not engaged on international voyages, and all passenger ships irrespective of size are to be fitted with AIS. Due to its worldwide mandate and adoption, AIS is one of the most successful maritime technology deployments ever. AIS technology is increasingly being deployed on smaller vessels as well as radio/AIS enabled Aids To Navigation ("AtoN") and Search and Rescue ("SAR") vessels and aircraft. The worldwide prevalence of AIS transponders has increased the value of AIS data not just for shipping, but also for naval forces, port authorities, coast guards, Homeland security, and other maritime authorities by enhancing safety and improving maritime situational awareness.

From a global perspective, however, AIS suffers from a major limitation: due to the curvature of the Earth, its range is limited to approximately 20-30 nautical miles (nm) at sea, and 50 nm from coastlines under most atmospheric conditions. Satellite-based AIS addresses this challenge. While a ship at sea has an effective RF range of 20-30 nm with respect to another terrestrial or maritime station, a low Earth orbiting ("LEO") satellite field of view can be over 3000 nm. Since the Iridium NEXT system provides true global, overlapping coverage, vessels will be "seen" not only by dozens of satellites a day, but also many times a day by multiple satellites simultaneously. This level of satellite AIS coverage results in significant vessel detection improvement over the current state of the art and represents the largest and most advanced satellite AIS constellation in the world. Reception of AIS in space by the VHF Hosted Payload will unlock an unprecedented level of maritime situational awareness, invaluable to commercial, government, and private users alike.

The VHF Hosted Payload on Iridium NEXT will also benefit the public by providing real time maritime domain AIS information. Existing satellite-based AIS systems utilize store-and-forward mechanisms when not in range of a ground terminal. Such existing satellites collect and store AIS messages until coming within transmission range of a dedicated earth station. The existing satellites then forward (downlink) the messages to the ground for ultimate delivery to customers. This mode of operation results in system-wide latency for delivering AIS data to customers. The VHF Hosted Payload receivers, in contrast, will leverage the cross-linked system architecture of the Iridium NEXT constellation to enable true real-time awareness. Because the Iridium NEXT satellites will be networked together with cross-links (fore/aft and orbital plane-to-plane) and in constant communication with multiple ground stations, AIS messages received by the VHF Hosted Payload receivers will deliver to the ground, in real time, AIS, DSC and other maritime domain information. This system will be the only one in the world that can provide the level of performance required for truly instantaneous global maritime domain awareness.

FCC authorization of the VHF Hosted Payload receiver would be consistent with the U.S. policy and leadership favoring expanding satellite detection of AIS messages. As the Commission noted in the *WRC-07/WRC-12 Order*, the United States proposed, and WRC-12 adopted, mobile-satellite allocations for the 156.775 MHz and 156.825 MHz AIS-3/AIS-4 or Long-Range AIS-1/Long-Range AIS-2 channels.[6] The Commission subsequently proposed to add mobile-satellite allocations to the U.S. Table of Allocations for these channels, in order to

[6] *See* Amendment of Parts 1, 2, 15, 25, 27, 74, 78, 80, 87, 90, 97, and 101 of the Commission's Rules Regarding Implementation of the Final Acts of the World Radiocommunication Conference (Geneva, 2007) (WRC-07), Other Allocation Issues, and Related Rule Updates, *et al.*, ET Docket No. 12-338, *Report and Order, Order, and Notice of Proposed Rulemaking*, 30 FCC Rcd 4183, 4252-53 ¶¶ 199-200 (2015) ("*WRC-07/WRC-12 Order*").

facilitate satellite-based AIS reception.[7] In keeping with this proposal, Iridium herein seeks authority to receive AIS messages over these channels on a non-exclusive basis on the VHF Hosted Payload in the United States and internationally.

The VHF Hosted Payload receiver offers a comprehensive maritime VHF solution by including the capability of operating across the expanding number of maritime channel assignments. Use of AIS has grown to include such applications as AtoN, ASMs, Search and Rescue Transmitter ("SART"), Man Over-Board ("MOB") units, and Emergency Position-Indicating Radio Beacon ("EPIRB")-AIS. This has caused significant increase in VHF Data Link ("VDL") loading, which is an active concern in the IMO and the International Telecommunication Union ("ITU") because it degrades fundamental AIS performance. In response, the international community has acted to identify additional VHF channels to be used for maritime domain awareness applications. For example, experts have recommended a revision to the AIS system that would move ASMs to two additional channels. The VHF Hosted Payload ensures customers will receive a comprehensive maritime solution by including the capability to receive messages over ASM 1 and ASM 2 (161.950 MHz and 162.000 MHz).

As the Commission has recognized, the DSC-R channel at 156.525 MHz is emerging as another critical mechanism for maritime safety communications. In the recent *WRC-07/WRC-12 Order*, the Commission allocated the 156.5125-156.5375 MHz band to the maritime mobile service on a primary basis for Federal and non-Federal use, restricting the use of the new allocation to distress, urgency, safety, and calling via DSC.[8] Similarly, 156.8 MHz is allocated internationally for the maritime mobile service and is identified as an international distress,

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7 *Id.* ¶ 202.

8 *Id.* ¶ 101.

safety and calling frequency.[9] Granting Iridium's request to authorize reception over these channels on a non-interference basis via the VHF Hosted Payload will greatly improve the life-saving functionality of these services without requiring any alteration of, or risking interference to, existing equipment.

III. REQUEST FOR WAIVERS

The Commission may grant a waiver for good cause shown.[10] The Commission typically grants a waiver where the particular facts make strict compliance inconsistent with the public interest.[11] In granting a waiver, the Commission may take into account considerations of hardship, equity, or more effective implementation of overall policy on an individual basis.[12] Waiver is therefore appropriate if special circumstances warrant a deviation from the general rule, and such a deviation will serve the public interest. Iridium respectfully requests that the Commission grant the following waivers, to the extent required.

A. Sections 2.106

To the extent necessary, Iridium seeks waiver of Section 2.106 (the "U.S. Table of Frequency Allocations") for the VHF Hosted Payload to receive on the following frequencies which are not currently allocated by the United States to the mobile-satellite service ("MSS"): 156.775 MHz "Long Range AIS 1", 156.825 MHz "Long Range AIS 2", 156.525 MHz "DSC-R", 156.8 MHz maritime mobile distress calling, 161.950 MHz "ASM 1", and 162.000 MHz

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9 47 C.F.R. § 2.106 n. 5.226.

10 47 C.F.R. §1.3.

11 *N.E. Cellular Tel. Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990) ("*Northeast Cellular*").

12 *WAIT Radio v. FCC*, 418 F.2d 1153, 1159 (D.C. Cir. 1969); *Northeast Cellular*, 897 F.2d at 1166.

"ASM 2".[13] In the past, the Commission has found it unnecessary to revise the Table of Frequency Allocations to permit satellite-based reception of maritime VHF frequencies like AIS, because "the feasibility of satellite AIS does not depend on any new uplink authorization inasmuch as the satellite will be able to receive the same AIS transmissions that are already authorized under ship station licenses."[14] The Commission continued, "[i]n these circumstances, we do not discern anything in the existing Section 2.106 Table of Frequency Allocations or elsewhere in the Commission's Rules that would preclude satellite AIS."[15] If no MSS allocation is needed in the Table of Frequency Allocations to permit satellite-based reception of maritime VHF frequencies, then no waiver of the Table of Frequency Allocations should be needed for

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[13] No waiver should be needed outside the United States for the Long Range AIS 1 (156.775 MHz) and Long Range AIS2 (156.825 MHz) channels, which are allocated to MSS on a primary basis in Region 2 and on a secondary basis in Regions 1 and 3. The VHF Hosted Payload can be authorized to operate on these frequencies outside the United States in accordance with these international allocations, and can be authorized now to operate in the United States on an allocated basis effective upon the Commission's adoption of its proposal to add a U.S. allocation. *See* Amendment of Parts 1, 2, 15, 25, 27, 74, 78, 80, 87, 90, 97, and 101 of the Commission's Rules Regarding Implementation of the Final Acts of the World Radiocommunication Conference (Geneva, 2007) (WRC-07), Other Allocation Issues, and Related Rule Updates, *et al.*, ET Docket No. 12-338, *Report and Order, Order, and Notice of Proposed Rulemaking*, 30 FCC Rcd 4183, 4254 ¶ 202 (2015) ("*WRC-07/WRC-12 Order*"). There is no international allocation, on the other hand, for MSS (Earth-to-Space) operations on the frequencies 156.525 MHz, 156.8 MHz, 161.950 MHz and 162 MHz, so MSS operations on those frequencies would need to be authorized internationally on an unallocated unprotected basis. To the extent necessary for these channels, and for the same reasons stated below, Iridium also seeks a waiver of Section 25.112(a)(3), which states that an application will be deemed defective if it "requests authority to operate a space station in a frequency band that is not allocated internationally for such operations under the Radio Regulations of the International Telecommunication Union." 47 C.F.R. § 25.112(a)(3).

[14] Amendment of the Commission's Rules Regarding Maritime Automatic Identification Systems, WT Docket No. 04-344, *Second Report and Order*, 23 FCC Rcd 13711, 13721 n. 73 (2008)("*Maritime AIS Second Report and Order*"). The Commission allocated the 161.9625-161.9875 MHz AIS-1 and 162.0125-162.0375 MHz AIS-2 bands to MSS on a primary basis in a recent Order implementing the results of WRC-07 and WRC-12. *See WRC-07/WRC-12 Order* at 4226 ¶¶ 111-114 (2015).

[15] *Maritime AIS Second Report and Order* at 13722 n. 73.

Iridium to engage in satellite-based reception on an unallocated unprotected basis of maritime VHF frequencies, including Long Range AIS, ASM, DSC-R, and 156.8 MHz mobile maritime distress calling channels without a mobile-satellite allocation in the respective frequencies.

However, to the extent the Commission determines that a mobile-satellite allocation is required for such receive-only operations, Iridium respectfully requests a waiver of the Table of Allocations for the respective channels. The Commission may grant a waiver of the Table of Allocations for non-conforming uses of spectrum when, as here, there is little potential for interference into any service authorized under the Table of Allocations.[16] Moreover, grant of the requested waiver is consistent with Commission precedent. Specifically, the Commission granted a waiver to Orbcomm to the extent necessary to permit that company to launch and operate satellites capable of receiving existing AIS signals transmitted by maritime vessels.[17] In granting a waiver to Orbcomm, the Commission noted that because it would only receive existing AIS signals transmitted by maritime vessels, there was no risk of additional interference,[18] and determined that it would be in the public interest to waive the Table of

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16 Applications by Orbcomm License Corp. for Authority to Modify its Non-Voice, Non-Geostationary Satellite System, et al., IBFS File Nos. SAT-MOD-20070531-00076, SAT-AMD-20071116-00161, *Order and Authorization*, 23 FCC Rcd 4804, 4809 ¶ 15, n. 42 (2008) ("*Orbcomm Order*") (*citing* Fugro-Chance, Inc., *Order and Authorization*, 10 FCC Rcd 2860 (Int'l Bur. 1995) (authorizing operations of receive-only mobile earth terminals in the 11.7-12.2 GHz band on a non-interference basis)); *see also* Intelsat North America LLC, Application for Authority to Modify Earth Station Authorization to Provide Launch and Early Orbit Phase ("LEOP") Operations for Newly Launched Satellites, *Order and Authorization*, 21 FCC Rcd 14672, 14674 (¶ 6) (Int'l Bur. 2006) ("If a proposal will not cause interference to other licensed operations, the Commission generally authorizes it if it is otherwise in the public interest.").

17 *Orbcomm Order* at ¶ 15.

18 *Id.*

Frequency Allocations to the extent necessary to permit Orbcomm to launch and operate satellites capable of receiving the requested AIS frequencies.[19]

The reasoning of the *Orbcomm Order* applies fully in this instance. As described above, authorizing the launch and operation of the VHF Hosted Payload would serve the public interest by making available a robust, satellite-based, real-time global maritime domain tracking and information solution. Additionally, like the Orbcomm receiver, there is no risk of additional interference caused by the VHF Hosted Payload. Because it is receive-only, it will rely on ship-based transmissions that are already occurring, and will not prevent anyone else from using the band. Moreover, as it did in the *Orbcomm Order*, the Commission can ensure that the waiver will serve the public interest by conditioning the authorization to require that Iridium not claim protection from interference caused to it by any other lawfully operating radiofrequency operations in these bands.[20]

Facilitating satellite reception of the maritime VHF channels at issue would better help realize the full potential of this band for maritime safety and awareness. Indeed, Iridium notes that the Commission proposed in the *WRC-07/WRC-12 Order* to revise the Table of Allocations to include a mobile-satellite allocation for the Long Range AIS-1 and Long Range AIS-2 channels.[21] No comments in response to the Commission's Further Notice of Proposed Rulemaking opposed this proposal. Permitting satellite reception of the AIS signals in this band would be a reasonable step in furtherance of the policy goals of this proposal. Moreover,

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19 *Id.*

20 *Cf. id.*

21 *WRC-07/WRC-12 Order*, ¶ 202.

extending satellite reception to the newly allocated DSC channel at 156.525 MHz,[22] the ASM channels at 161.950 MHZ and 162.00 MHz, and to the international mobile maritime distress calling channel at 156.8 MHz would enable Harris to provide a more comprehensive maritime VHF solution to its government and civil customers, with no risk of harmful interference.

B. Section 25.114(c)(4)(vi)(B)

The attached Engineering Statement Supplement provides substantial detail about the coverage and service area of the VHF Hosted Payload receivers, including a representative -3dB antenna gain contour, color pictorials of normalized antenna gain over ground showing areas of gain ranges from 0 – 12 dB, and additional information regarding the constellation footprint. The Engineering Statement does not, however, include the specific 2 dB, 4 dB, 6 dB, 8 dB, 10 dB, 15 dB and 20 dB contours required by Section 25.114(c)(4)(vi)(B), and thus, to the extent necessary, Iridium requests a waiver of this rule. A waiver is justified here because the information included in the application is sufficient to give a detailed picture about the performance and coverage area of the VHF Hosted Payload receiver. Additionally, there is no risk of harmful interference posed by the VHF Hosted Payload, as no satellite transmissions would be authorized or possible over that payload. Finally, per the waiver request above, proposed operations over Long Range-AIS 1 and 2, ASM 1 and 2, DSC-R, and the international maritime mobile distress calling channel at 156.8 MHz are all requested on an unprotected basis.

C. Cross Polarization Information

As explained in the Engineering Supplement, the subscriber terminals are linearly polarized and cross polarization is not used to discriminate between multiple simultaneous

[22] *See id.* ¶ 101 (allocating the 156.5125-156.5375 MHz band to the maritime mobile service on a primary basis for Federal and non-Federal use, and restricting the use of the new allocation to distress, urgency, safety, and calling via digital selective calling).

transmitted signals on the same frequency. As a result, the requested information on cross-polarization in Schedule S is irrelevant. Nevertheless, to the extent that this information is required to be provided in Schedule S, Iridium requests a waiver since the cross polarization information for the two VHF receive antenna patterns is not available.

D. Sections 25.210(f), 25.210(i), and 25.287

To the extent necessary, Iridium seeks a waiver of Section 25.210(f), 25.210(i), and 25.287 of the Commission's rules, which otherwise may apply as default rules to the satellite-based AIS-1 and AIS-2 operations proposed in this Amendment. As explained in more detail in the Engineering Supplement accompanying this Amendment, each of these rules is unnecessary for or inapplicable to the receive-only VHF Hosted Payload that is the subject of this Amendment. Waiver of the rules would serve the public interest by facilitating the prompt and efficient introduction of advanced satellite-based maritime VHF operations.

Because there is a mobile satellite service allocation in the AIS-1 and AIS-2 bands for the United States, but service rules for this band have not been adopted for mobile satellite operation in the bands, the Commission's default service rules apply to the use of these frequencies in the United States and by vessels under United States jurisdiction. For NGSO satellite systems such as Iridium NEXT, section 25.217(b) of the default rules applies.[23] Section 25.217(b)(1) specifies that the satellite system must comply with the technical requirements of §25.142(d), §25.143(b)(2)(ii), §25.143 (b)(2)(iii), §25.204(e), §25.210(d), §25.210(f) and §25.210(i). Section 25.217(b)(2) addresses coordination with Federal government users. And Section 25.217(b)(3) addresses matters related to earth station operations and licensing. While compliance with most of these rules has been demonstrated either through the original Iridium

[23] 47 C.F.R. § 25.217(b).

NEXT application or through this Amendment, some of the rules seem ill-fit for the VHF Hosted Payload, and thus Iridium requests a finding that these rules do not apply here, or to the extent necessary, waiver of these rules.

In particular, Iridium requests waiver, to the extent necessary, of Sections 25.210(f), 25.210(i), and 25.287 of the Commission's rules. Sections 25.210(f) and 25.210(i) are rules intended for space stations in the Fixed Satellite Service and would apply requirements for frequency reuse or antenna cross-polarization. As an initial matter, it is not clear whether these FSS rules are intended to apply by default to MSS operations. Nevertheless, these rules should be found inapplicable or unnecessary for the receive-only VHF Hosted Payload, which employs other technical solutions to achieve the goals of these rules. The VHF Hosted Payload is designed to accomplish frequency reuse, discriminate among maritime mobile terminals operating on the VHF frequencies, and provide full robust service throughout its coverage area without the need for spatially independent beams or special polarizations, in part through its specialized use of two antenna beams operating on the same frequencies with the same polarization.[24]

Section 25.287 is equally inapplicable to the VHF Hosted Payload. This rule addresses operational considerations for mobile earth stations, but no new mobile earth stations would be authorized by this Amendment. The VHF Hosted Payload will receive VHF transmissions from existing and future maritime mobile transmitters that will be separately authorized by an appropriate process. The VHF Hosted Payload system is a passive receiver of these signals and does not control the mobile station AIS transmissions in any way.

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[24] *See* Engineering Supplement at 7-8.

E. Section 25.164 & Section 25.165

The Commission previously has determined that the performance bond requirements of Section 25.165 do not apply in the case of replacement satellites that include the addition of a receive-only maritime VHF payload.[25] Iridium respectfully requests the same treatment here, and seeks to amend its modification application to include authority to receive signals over the maritime VHF channels indicated above on its next generation satellites without the need to file a performance bond. Alternatively, should the Commission conclude that the Section 25.165(e) exemption from the bond requirement for replacement satellites does not apply in this case, and that a performance bond should be required, Iridium respectfully requests that the Commission waive that requirement.[26]

The FCC should grant this amendment without imposing a bond because the circumstances of Iridium's request are directly analogous to those present in the Orbcomm case. Orbcomm was authorized to launch and operate six replacement satellites that operated over the same frequencies as its existing NGSO constellation, except for the addition of an AIS receiver payload operating in the 161.9625-161.9875 MHz AIS-1 and 162.0125-162.0375 MHz AIS-2 frequency bands, without the need for a performance bond.[27] There the Commission noted that because Orbcomm's replacement satellites "involve[d] the same Little LEO frequencies and

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[25] *See Orbcomm Order* at n. 14.

[26] To the extent necessary, Iridium also requests a waiver of the milestone requirements of Section 25.164. 47 C.F.R. § 25.164. For largely the same reasons as in the case of a performance bond, construction milestones are unnecessary in this instance. Iridium seeks receive-only authority to operate over the maritime VHF frequencies; construction of the satellites themselves are well underway, with launch of the VHF Hosted Payloads expected to begin with the second Iridium NEXT launch, and so applying a milestone requirement, which is intended to prevent spectrum warehousing, would be unnecessary .

[27] *Orbcomm Order* at ¶ 22.

service areas as authorized, the bond requirements do not apply."[28] Just like Orbcomm, Iridium here seeks to replace its NGSO satellite constellation with new satellites that will operate in the same MSS frequency bands as before but also include a receive-only maritime VHF payload. As Iridium seeks no change to the Big LEO frequencies or coverage area in this application, the Commission's determination in *Orbcomm* that no performance bond is required should apply.

Should the Commission determine that a performance bond is required, however, Iridium seeks waiver of the Section 25.165 requirement to post a bond.[29] A waiver would be consistent with the underlying purposes of the rule for multiple reasons.

First, bond payments protect "against speculation and warehousing," a concern not germane to the instant application.[30] Here, Iridium seeks to add a receive-only hosted payload capable of receiving maritime VHF frequencies on a non-exclusive basis. In other words, Iridium would neither gain any exclusive spectrum rights in the VHF band pursuant to this application, nor be capable of warehousing spectrum. Nothing in the instant application would "preclude[] another party willing and able to construct a satellite [or hosted payload]" capable of receiving the AIS, ASM, DSC, or mobile maritime distress frequencies "from doing so."[31] *Second*, bond posting serves as a driver for a satellite licensee "to construct and launch its satellite system."[32] Iridium needs no such motivation to construct and launch Iridium NEXT, which but for the inclusion of the VHF Hosted Payload would qualify as a replacement

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28 *Id.* at n. 14

29 47 C.F.R. §§ 25.165.

30 *Amendment of the Commission's Space Station Licensing Rules and Policies*, First Report and Order, 18 FCC Rcd 10760, ¶ 170 (2003) ("*First R&O*").

31 *Amendment of the Commission's Space Station Licensing Rules and Policies*, First Reconsideration Order and Fifth Report and Order, 19 FCC Rcd 12637, ¶ 25 (2004) ("*First Recon Order*").

32 *First R&O*, ¶ 167.

satellite.[33] Indeed, construction of the constellation is well underway, testing of the payloads has already begun, and launch of the constellation is scheduled to begin later this year.[34] *Third*, a waiver would be consistent with the Commission's expressed "sensitiv[ity] to concerns regarding new and innovative satellite services."[35] The maritime VHF payload hosted on Iridium NEXT would allow Harris market entry, and the bond payment is not proportional to Harris's capital outlay.[36] In short, the Commission's rules for posting of bonds should not apply to hosted payloads only capable of receiving communications on a non-exclusive basis in general, and in this case, there simply is no need and no public interest benefit to imposing a bond requirement on the VHF Hosted Payload.

IV. CONCLUSION

For the foregoing reasons, Iridium hereby respectfully requests that the Commission grant its modification application for the Iridium NEXT satellite system, as amended above.

Respectfully submitted,

By: */s/ Thomas D. Hickey*

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Dated: October 22, 2015

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33 47 C.F.R. § 25.165(e).

34 As noted above and in the Engineering Supplement accompanying this application, although the first launch of the Iridium NEXT satellite constellation is currently planned for December 2015, space vehicles including the VHF Hosted Payload are not expected to begin launching until the second Iridium NEXT launch, scheduled for four months after the initial launch and currently expected to take place in April 2016. VHF Hosted Payload-equipped satellites will be included on each subsequent Iridium NEXT launch.

35 *First Recon Order*, ¶ 35.

36 Due to contractual arrangements between Harris and Iridium, Harris would bear the cost of procuring and carrying any required bond.

Exhibit A
FCC Form 312, Response to Question 34: Foreign Ownership

Iridium Constellation LLC holds a non-common carrier "Big LEO" NGSO space station constellation license. Accordingly, this modification application is not subject to the foreign ownership limitations set forth in Section 310(b) of the Communications Act.

The Commission has approved the foreign ownership of Iridium Holdings LLC (the indirect parent company of both Iridium Constellation LLC and Iridium Carrier Services LLC, which holds a common carrier earth station license) in excess of twenty-five percent and has provided Iridium Carrier Services LLC flexibility to acquire additional foreign ownership subject to certain conditions. *See* Applications of Space Station System Licensee, Inc., Assignor, and Iridium Constellation LLC, Assignee, for Consent to Assignment of License Pursuant to Section 310(d) of the Communications Act, *Memorandum Opinion, Order and Authorization*, DA 02-307, 17 FCC Rcd 2271 (Int'l Bur. 2002) ("2002 Iridium Order"); Iridium Holdings LLC and Iridium Carrier Holdings LLC, Transferors, and GHL Acquisition Corp., Transferee, Applications for Consent to Transfer Control of Iridium Carrier Services LLC, Iridium Satellite LLC, and Iridium Constellation LLC, *Memorandum Opinion and Order*, IB Docket No. 08-232, DA 09-1809, 24 FCC Rcd 10725 (Int'l Bur. 2009) ("Iridium-GHL Order"). Since the Iridium-GHL Order, any changes to the foreign ownership of Iridium Holdings LLC have been consistent with Iridium Communications Inc.'s status as a publicly traded company including a possible decrease in foreign ownership in Iridium Communications Inc.

Exhibit B
FCC Form 312, Response to Question 40:
Officers and Directors of Iridium Constellation LLC

The name, principal business, address, citizenship, and ownership interest of each individual or entity that will directly or indirectly control a ten percent or greater interest in Iridium Constellation LLC is as follows:

Name:	Iridium Satellite LLC
Principal Business:	Holding company and global provider of mobile satellite products and services
Address:	1750 Tysons Boulevard Suite 1400 McLean, Virginia 22102
Citizenship:	U.S.
Voting Interest:	100% (of Iridium Constellation LLC)
Equity Interest:	100% (of Iridium Constellation LLC)

Name:	Iridium Holdings LLC
Principal Business:	Holding Company
Address:	1750 Tysons Boulevard Suite 1400 McLean, Virginia 22102
Citizenship:	U.S.
Voting Interest:	100% (of Iridium Satellite LLC)
Equity Interest:	100% (of Iridium Satellite LLC)

Name:	Syncom-Iridium Holdings Corporation
Principal Business:	Holding Company
Address:	1750 Tysons Boulevard Suite 1400 McLean, Virginia 22102
Citizenship:	U.S.
Voting Interest:	13.7% (of Iridium Holdings LLC)
Equity Interest:	13.7% (of Iridium Holdings LLC)

Name:	Iridium Blocker-B Inc.
Principal Business:	Holding Company
Address:	1750 Tysons Boulevard Suite 1400 McLean, Virginia 22102
Citizenship:	U.S.
Voting Interest:	36.2% (of Iridium Holdings LLC)
Equity Interest:	36.2% (of Iridium Holdings LLC)

Name:	Iridium Communications Inc.
Principal Business:	Holding Company
Address:	1750 Tysons Boulevard Suite 1400 McLean, Virginia 22102
Citizenship:	U.S.
Voting Interest:	50.1% (of Iridium Holdings LLC) 100% (of Syncom-Iridium Holdings Corp.) 100% (of Iridium Blocker-B Inc.)
Equity Interest:	50.1% (of Iridium Holdings LLC) 100% (of Syncom-Iridium Holdings Corp.) 100% (of Iridium Blocker-B Inc.)

Name:	Baralonco Limited
Principal Business:	Holding Company
Address:	Craigmuir Chambers P.O. Box. 71 Road Town, Tortola, British Virgin Islands
Citizenship:	British Virgin Islands
Voting Interest:	13.1% (of Iridium Communications Inc.)
Equity Interest:	14.1% (of Iridium Communications Inc.)

Name:	Khalid bin Abdullah bin Abdulrahman
Principal Business:	Businessman and Investor
Address:	Craigmuir Chambers P.O. Box. 71 Road Town, Tortola, British Virgin Islands
Citizenship:	Saudi Arabia
Voting Interest:	100% (of Baralonco Limited)
Equity Interest:	100% (of Baralonco Limited)

Iridium Constellation LLC is a Delaware limited liability company. Iridium Satellite LLC has been designated as "Manager" of Iridium Constellation LLC. The following individuals have been designated as "officers" via special resolution of the Manager:

Matthew J. Desch, President and Chief Executive Officer
Thomas J. Fitzpatrick, Chief Financial Officer and Treasurer
Thomas D. Hickey, Chief Legal Officer and Secretary
Bonnie Shub-Gayer, Vice President, Tax