

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

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In the Matter of	)	
	)	
Iridium Constellation LLC	)	File No. SAT-MOD-2012_____
	)	
Application for Modification of	)	
Authorization (Call Sign S2110)	)	

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**APPLICATION OF IRIDIUM CONSTELLATION LLC  
FOR MODIFICATION OF AUTHORIZATION**

Iridium Constellation LLC (“Iridium”), pursuant to Section 25.117 of the rules of the Federal Communications Commission (the “Commission” or “FCC”),<sup>1</sup> hereby seeks to modify its authorization for its “Big LEO” band non-geostationary satellite orbit (“NGSO”) constellation (call sign S2110).<sup>2</sup> On November 13, 2012, spare satellite SV094 began operation and replaced satellite SV023 in plane 2, slot 2.<sup>3</sup> At that time, Iridium suspended mission operations of SV023 in order to maintain it as a spare. Pursuant to a grant of special temporary authority, SV023 is currently drifting to its proposed spare parking orbit at mission altitude approximately 300 kilometers behind SV094. This modification application seeks permanent authority to keep SV023 at this proposed parking orbit.

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<sup>1</sup> 47 C.F.R. § 25.117.

<sup>2</sup> See *Motorola Satellite Communications, Inc. for Authority to Construct, Launch, and Operate a Low Earth Satellite System in the 1616-1626.5 MHz Band*, 10 FCC Rcd 2268 (1995) (“*Motorola Order*”).

<sup>3</sup> On November 14, 2012, Iridium filed a spare satellite notification with the Commission pursuant to Section 25.143(d). See Letter from Donna Bethea Murphy, Iridium Constellation LLC, to Marlene H. Dortch, Federal Communications Commission (filed Nov. 14, 2012).

In accordance with the Commission’s rules, this application has been filed electronically as an attachment to FCC Form 312.<sup>4</sup> In Exhibit A, Iridium provides an Engineering Statement containing technical information relating to the proposed positioning of SV023. To the extent necessary, Iridium requests waiver of the requirement to provide electronically a completed FCC Form Schedule S. Except as identified in the narrative below and in the Engineering Statement, the remainder of the technical information previously provided to the FCC is not changing and is incorporated by reference.<sup>5</sup>

**I. DESCRIPTION OF THE AUTHORITY REQUESTED**

On January 1, 1995, the FCC authorized Iridium’s predecessor in interest to launch and operate an NGSO mission constellation of 66 satellites in the Big LEO band along with 12 in-orbit spares “in accordance with the technical specifications set forth in its applications . . . .”<sup>6</sup> The application of Iridium’s predecessor in interest specified that spare satellites would “be placed in a nominal 645 km orbit.”<sup>7</sup>

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<sup>4</sup> 47 C.F.R § 25.117(c).

<sup>5</sup> See Motorola Satellite Communications, Inc., Minor Amendment to Application of Motorola Satellite Communications, Inc. for Authority to Construct, Launch and Operate a Low Earth Orbit Satellite System in the 1616-1626.5 MHz Band, File No. SAT-AMD-19941115-00069 (filed Nov. 15, 1994) (“Motorola 1994 Amendment”); Motorola Satellite Communications, Inc., Application for Minor License Modifications and Technical Waivers, File No. SAT-MOD-19960322-00047 (filed Mar. 8, 1996) (“Motorola 1996 Application”); Iridium Constellation LLC, Application for Minor Modification of Mobile Satellite Service Authorization to Update Orbital Debris Mitigation Requirements, File No. SAT-MOD-20080701-00140 (filed Jul. 1, 2008); Iridium Constellation LLC, Application for Modification of Authorization (Call Sign S2110), File No. SAT-MOD-20120813-00128 (filed Aug. 13, 2012) (“Iridium Co-location Modification”).

<sup>6</sup> See *Motorola Order*, ¶ 25. On July 19, 2012, Iridium increased its total number of space stations and commenced operating a pair of co-located satellites in plane 4, slot 7 of its NGSO mission constellation pursuant to a grant of special temporary authority (“STA”). See File No. SAT-STA-20120716-00116 (filed July 16, 2012); File No. SAT-STA-20120813-00129 (filed Aug. 13, 2012); File No. SAT-STA-20120927-00157 (filed

On November 13, 2012, Iridium brought spare satellite SV094 into operation in plane 2, slot 2 to replace satellite SV023, which then suspended mission operations in order to be maintained as a spare. On November 14, 2012, Iridium, pursuant to a grant of special temporary authority, began to drift spare satellite SV023 to a parking orbit at its current mission altitude rather than lowering it to the spare satellite orbit.<sup>8</sup> This application seeks permanent authority to position spare satellite SV023 approximately 300 kilometers behind operational satellite SV094 in a parking orbit at approximately 778 kilometers, its current mission altitude, instead of the nominal 645-kilometer orbit. SV023 will not be co-located with SV094 and will not operate as part of Iridium's mission constellation.<sup>9</sup>

## **II. GRANT OF THE MODIFICATION WILL SERVE THE PUBLIC INTEREST**

Grant of this modification application will serve the public interest. In evaluating space station modifications, “the Commission has determined that spacecraft design decisions should be left to each space station licensee, because the licensee is in a better position to determine how to tailor its system to meet the particular needs of its customer base.”<sup>10</sup> This “flexible” policy “allow[s] satellite operators to respond promptly to

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Sept. 27, 2012). Iridium also filed a modification application seeking regular authority to periodically co-locate and operate additional satellites in its mission constellation, which remains pending. *See Iridium Co-location Modification*. As described herein, satellite SV023 will not be co-located with satellite SV094.

<sup>7</sup> Motorola 1994 Amendment, at Table R-1 n.1.

<sup>8</sup> *See Iridium Constellation LLC, Application for Special Temporary Authority*, File No. SAT-STA-20121108-00195 (filed Nov. 8, 2012). Iridium estimates that SV023 to reach the parking orbit on approximately December 13, 2012. *See Engineering Statement, Exhibit A*.

<sup>9</sup> *See Engineering Statement, Exhibit A; File No. SAT-MOD-20120813-00128*.

<sup>10</sup> *DigitalGlobe, Inc., Order and Authorization*, 20 FCC Rcd 15696, ¶ 9 (I.B. 2005).

changing technological . . . conditions.”<sup>11</sup> Accordingly, “[i]f a [modification] proposal will not cause interference to other licensed operations, the Commission generally authorizes it if it is otherwise in the public interest.”<sup>12</sup>

Grant will serve the public interest by minimizing the amount of fuel that SV023 expends and extending the satellite’s operational life. The Commission has previously held that “conserve[ing] fuel for future operations” is in the public interest and justifies grant of a modification application.<sup>13</sup> Here, very little fuel will be required to position SV023 in a parking orbit at its mission altitude. Iridium will rely primarily on atmospheric drag to move the satellite 300 km over the course of approximately one month. In contrast, Iridium would need to fire the satellite’s thrusters to establish the momentum needed to lower the orbit of the satellite to the nominal 645 km. And, Iridium would need to use fuel again in order re-position the satellite back to mission altitude if the spare is needed as a replacement. As such, grant of this proposed modification application will conserve fuel on SV023. Such fuel savings serve the public interest now by extending the satellite’s mission life and in the future by facilitating safe deorbiting.

Moreover, grant of this modification request poses no interference risk. The proposed location of SV023 approximately 300 km behind SV094 ensures safe station-keeping of both satellites without any overlap in orbital position. Further, SV023 will not operate any mission frequencies while positioned in the parking orbit. It will not be co-

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<sup>11</sup> *Assignment of Orbital Locations to Space Stations in the Domestic Fixed-Satellite Service*, Memorandum Opinion and Order, 3 FCC Rcd 6972, ¶ 2 (1988); *see also DigitalGlobe, Inc.*, ¶ 9.

<sup>12</sup> *DigitalGlobe, Inc.*, ¶ 9 (citing *EarthWatch Inc.*, Order and Authorization, 16 FCC Rcd 15985, ¶ 10 (I.B. 2001)).

<sup>13</sup> *SES Americom, Inc.*, Order and Authorization, 20 FCC 11542, ¶ 14 (I.B. 2005).

located or and operated in tandem with SV094. Instead, only the satellite's TT&C frequencies will be utilized.

### **III. REQUEST FOR WAIVER**

To the extent necessary, Iridium requests a waiver of the Section 25.117(c) requirement to provide FCC Form Schedule S.<sup>14</sup> The Commission may waive its rules for good cause shown.<sup>15</sup> The FCC typically exercises its discretion to waive a rule when the particular facts make strict compliance inconsistent with the public interest.<sup>16</sup> In addition, the agency may take into account considerations of hardship, equity, or more effective implementation of overall policy on an individual basis.<sup>17</sup>

Good cause exists to waive the requirement for Iridium to submit a FCC Form Schedule S with this modification application. None of the technical information requested by Schedule S will change when Iridium moves SV023 to a parking orbit. Schedule S does not request information with respect to the orbital positioning of spare satellites in non-geostationary satellite orbit constellations. Under such circumstances, the burden associated with completing an electronic FCC Form Schedule S outweighs any benefit. For these reasons, good cause exists, to the extent necessary, to grant a waiver of the requirement to provide FCC Form Schedule S.

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<sup>14</sup> 47 C.F.R. § 25.117(c). Iridium will, however, prepare and file a Schedule S in the event the Commission determines that such a submission is necessary.

<sup>15</sup> 47 C.F.R. § 1.3.

<sup>16</sup> The Commission has considerable discretion as to whether to waive its rules. *See Office of Communication of United Church of Christ v. FCC*, 911 F.2d 803, 812 (D.C. Cir. 1990) (upholding the Commission's grant of a waiver "[g]iven the deference due the agency in matters of this sort"); *City of Angels Broadcasting, Inc. v. FCC*, 745 F.2d 656, 663 (D.C. Cir. 1984) (noting that the scope of review of a waiver determination by the Commission "is narrow and constrained").

<sup>17</sup> *WAIT Radio v. FCC*, 418 F.2d 1153, 1159 (D.C. Cir. 1969), *cert. denied*, 409 U.S. 1027 (1972); *Northeast Cellular Telephone Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990).

**IV. CONCLUSION**

For the reasons set forth above, Iridium respectfully requests that the Commission grant this modification application.

Respectfully submitted,

By: Donna Bethea-Murphy

Donna Bethea-Murphy  
Vice President, Regulatory  
Engineering  
Iridium Satellite LLC  
1750 Tysons Boulevard  
Suite 1400  
McLean, VA 22102

December 7, 2012

## **Engineering Statement**

The following describes the proposed drift and positioning of spare satellite SV023 in a parking orbit approximately 300 kilometers behind operation satellite SV094 and at an altitude of approximately 778 kilometers, its current mission altitude:

### **Drift**

- SV023 executed several small station keeping maneuvers to increase its altitude by 50 meters. Relying primarily on atmospheric drag, SV023 is drifting to its storage orbit.
- SV023 is projected to drift for 40 days and arrive at its storage orbit on January 15, 2013.
- SV023 is projected to consume 0.01 kilograms of fuel to reach its mission altitude storage orbit. By contrast, in order to reach a spare orbit altitude of 645 kilometers, SV023 would need to consume 30 kilograms of fuel. This would leave insufficient fuel reserves for SV023 to return to the mission orbit if needed.

### **Parking Orbit**

- SV023 will be maintained at its mission altitude of approximately 778 kilometers. There will be a nominal in-track separation of 300 kilometers between SV023 and the other satellites in the same plane and a minimum polar plane crossing separation of 50 kilometers.
- The 300 kilometer in-track separation was chosen to provide a safe physical separation between SV023 and its in-plane neighbors as well as ensure a safe polar plane crossing separation. SV023 will execute nominal station keeping maneuvers to maintain the desired separation.

### **Frequencies**

- SV023 will use the Ka-Band frequency range of 29.1-29.3 GHz for TT&C uplink communication and 19.4-19.6 GHz for TT&C downlink communication. These are the same frequencies which would be used if SV023 were deployed to the spare satellite altitude. The configuration of SV023 in relation to SV094 will not increase the amount of TT&C data transmitted to or by the satellites. This new configuration will not increase the number Ka-band passes at our TT&C and gateway sites. As such, SV023's parking orbit location will produce no increase in the Ka-band interference environment.

**Exhibit B**

**Certification of Iridium Constellation LLC**

I hereby certify that I am a technically qualified person and am familiar with Part 25 of the Commission's Rules and Regulations. The contents of the engineering statement were prepared by me or under my direct supervision and to the best of my knowledge are complete and accurate.

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/s/

Walter Everetts  
Executive Director, Satellite Operations and SCS Development  
Iridium



## 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 (rel. Aug. 14, 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 and the *2002 Iridium Order* and *Iridium-GHL Order*.<sup>18</sup>

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<sup>18</sup> This assessment with respect to the foreign ownership of Greenhill and the public shareholders relies on the detailed analyses conducted by the Altman Group in connection with the *Iridium-GHL Order*. *See Iridium-GHL Order* ¶¶ 41-43 (analyses of foreign ownership attributable to participation of GHQ IPO shareholders and Greenhill).

**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 Block-B Inc.)  
Equity Interest: 50.1% (of Iridium Holdings LLC)  
100% (of Syncom-Iridium Holdings Corp.)  
100% (of Iridium Block-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: 16.5% (of Iridium Communications Inc.)  
Equity Interest: 16.5% (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