

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

Application of	)	
	)	
Iridium Constellation LLC	)	Call Sign: S2110
	)	
For Special Temporary Authority	)	File No. SAT-STA-2013_____
	)	

**APPLICATION FOR SPECIAL TEMPORARY AUTHORITY**

On July 18, 2012, the International Bureau granted Iridium Constellation LLC (“Iridium”) special temporary authority (“STA”) for 30 days to increase its total number of space stations operating in its mission constellation by co-locating two satellites.<sup>1</sup> Since then, the International Bureau granted Iridium STA for eight additional 60-day periods—the most recent through December 9, 2013—to continue to operate an additional, co-located satellite in its mission constellation.<sup>2</sup> Iridium hereby requests STA for an additional sixty (60) days—from

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<sup>1</sup> See File No. SAT-STA-20120716-00116 (filed July 16, 2012). On July 19, 2012, Iridium brought in-orbit spare satellite SV051 into operation in its mission constellation and filed a notice with the FCC. See Letter from Donna Bethea-Murphy, Iridium Constellation LLC, to Marlene H. Dortch, Federal Communications Commission (filed July 26, 2012).

<sup>2</sup> See File No. SAT-STA-20130730-00100 (filed July 30, 2013); File No. SAT-STA-20130522-00073 (filed May 22, 2013); File No. SAT-STA-20130401-00056 (filed Apr. 1, 2013); File No. SAT-STA-20130131-00013 (filed Jan. 31, 2013); File No. SAT-STA-20121210-00213 (filed Dec. 10, 2012); SAT-STA-20120813-00129 (filed Aug. 13, 2012); See File No. SAT-STA-20120927-00157 (filed Sept. 27, 2012). Along with the August 13, 2012 STA application, Iridium filed a modification application seeking regular authority, which remains pending. See Iridium Constellation LLC, Application of Iridium Constellation LLC for Modification of Authorization, File No. SAT-MOD-20120813-00128 (filed Aug. 13, 2012) (“Iridium Modification Application”). The Commission put the application on public notice on September 28, 2012, and the pleading cycle on this public notice completed November 15, 2012. See Reply to Opposition, File No. SAT-MOD-20120813-00128 (filed Nov. 27, 2012). The Commission put the Iridium Modification Application on Public Notice a second time on September 27, 2013 because the first public notice incorrectly indicated the feeder link transmission frequency band. See Report No. SAT-00974. On November 4, 2013, HNS License Sub, LLC (“Hughes”) filed a Supplemental Petition to Deny, Dismiss or Defer, In Part the

December 10, 2013 through February 7, 2014—to maintain operation of an additional, co-located satellite in its mission constellation.<sup>3</sup> The operation of 67 satellites is made possible by technological developments and software upgrades allowing Iridium to co-locate two satellites. Grant of this STA request will serve the public interest because it will allow Iridium engineers the flexibility to address efficiently occasional system faults and anomalies and improve service quality for customers, including first responders and significant government users such as the Department of Defense.

## **I. BACKGROUND**

Until last year, Iridium operated a mission constellation of 66 satellites located in six orbital planes of eleven slots each in nearly circular polar orbits along with six in-orbit spares.<sup>4</sup> In July 2012, Iridium commenced operating a pair of co-located satellites in plane 4, slot 7 of its NGSO constellation pursuant to a grant of special temporary authority.

The Iridium satellites operate in low-Earth-orbit and use spectrum in the “Big LEO” band.<sup>5</sup> Most system processing is performed using software onboard each satellite instead of on

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Iridium Modification Application. Supplemental Petition to Deny, Dismiss or Defer, in Part of HNS License Sub, LLC, File No. SAT-MOD-20120813-00128 (filed Nov. 4, 2013) (“Hughes Supplemental Petition”). On November 19, 2013, Iridium filed an Opposition to the Hughes Supplemental Petition. Opposition of Iridium Constellation LLC, File No. SAT-MOD-20120813-00128 (filed Nov. 19, 2013). On November 29, 2013, Hughes filed a Reply, which completed the pleading cycle. Reply of HNS License Sub, LLC, File No. SAT-MOD-20120813-00128 (filed Nov. 29, 2013).

<sup>3</sup> See 47 C.F.R. § 25.120(b)(2).

<sup>4</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) (authorizing Iridium’s predecessor in interest to launch and operate a NGSO mission constellation of 66 satellites in the Big LEO band).

<sup>5</sup> See *Iridium Constellation LLC*, Order, 19 FCC Rcd 1474 (I.B. 2004).

the ground, which enables engineers to develop additional functionality and software-based solutions to occasional faults and anomalies in the system.<sup>6</sup>

## **II. REQUEST FOR SPECIAL TEMPORARY AUTHORITY**

This request seeks continued special temporary authority for Iridium to add a satellite to its mission constellation. Specifically, Iridium placed one of its spare satellites, SV051, in its mission constellation in plane 4, slot 7 pursuant a grant of special temporary authority. That orbital position in the Iridium constellation is also occupied by SV007, which experienced a partial technical anomaly in 2009.<sup>7</sup> SV051 is kept near the center of the orbital box for slot 7 in plane 4, and SV007 is located approximately 100 kilometers behind SV051. During the co-location, the SV051 satellite provides communications in the Big LEO Band while traffic routing uses the SV007 satellite. As a result of this co-location, the Iridium constellation consists of a total of 67 satellites, with twelve instead of 11 satellites operating in plane 4. The additional satellite is technically identical to the other operational satellites in the Iridium constellation, and the technical information provided in Iridium's modification application and previously provided to the Commission is incorporated by reference herein.<sup>8</sup>

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<sup>6</sup> *Iridium Communications Inc.*, United States Securities and Exchange Commission Form 10-K for year ending Dec. 31, 2012, at 15.

<sup>7</sup> *See Iridium Communications Inc. 2009 Annual Report and Request for Confidential Treatment* (filed Oct. 15, 2009).

<sup>8</sup> *See Iridium Modification Application; 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-L/A-19941115-00068* (granted Jan. 31, 1995) (“Motorola 1994 Amendment”); *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).

### **III. PUBLIC INTEREST STATEMENT**

Grant of this STA request will serve the public interest. Co-location of these two Iridium spacecraft is made possible through technological developments. Iridium has designed software upgrades that improve communications routing and satellite tracking. Implementation of these new software changes has enabled Iridium effectively to co-locate two satellites in slot 7 of plane 4. The co-location of these two satellites will demonstrate more robust flexibility in the configuration of the Iridium constellation. Such system flexibility may also facilitate the seamless future transition to the planned Iridium NEXT constellation. More immediately, it will result in more consistent connectivity and improved service quality for customers, such as first responders, the Federal government, and aid organizations.

Moreover, grant of this STA request poses no interference risk. The location of SV007 approximately 100 km behind SV051 ensures safe station-keeping of both satellites without any overlap in orbital position. In addition, the two satellites will operate in a complementary manner without increasing the number of satellites using Big LEO spectrum. Service link communications in the Big LEO band will be provided only on the SV051 satellite, which will be located in the station-keeping box for plane 4, slot 7 as authorized by the Commission. In each pair of co-located satellites, just one satellite will use Ka-band frequencies to receive TT&C communications. The other will receive a relay of any TT&C information from the first satellite via inter-satellite link frequencies outside the 29.25-29.3 GHz band. Finally, Iridium's software developments enable operation of both co-located satellites without harmful interference by connecting SV051 into the constellation using its forward crosslink and connecting SV007 into the constellation with its left and right crosslinks.

**IV. CONCLUSION**

Iridium respectfully requests that the Commission expeditiously grant this STA to permit continued operation of 67 satellites as described for a period of sixty (60) days.

Respectfully submitted,

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