

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

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Application of	)	
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Iridium Constellation LLC	)	Call Sign: S2110
	)	
For Special Temporary Authority	)	File No. SAT-STA-2017_____
_____	)	

**APPLICATION FOR SPECIAL TEMPORARY AUTHORITY**

On May 3, 2017, the Commission granted Iridium Constellation LLC (“Iridium”) special temporary authority (“STA”) for 30 days through June 2, 2017 to modify its authorization for its “Big LEO” band non-geostationary satellite orbit (“NGSO”) constellation (call sign S2110) to keep up to four first-generation satellite in a temporary 760 km storage orbit.<sup>1</sup> To ensure complete continuity of service as the entire Iridium first-generation satellite constellation is replaced, Iridium will need to continue to keep first-generation (“Block 1”) satellites in the storage orbit to be available as spares. The goal is to keep the most robust satellites in operational mode at all times and to remove from service and prepare for de-orbit less robust satellites. Accordingly, Iridium hereby requests STA for an additional thirty (30) days to keep up to four first-generation satellites in the temporary storage orbit.<sup>2</sup>

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<sup>1</sup> See Iridium Constellation LLC, SAT-STA-20170421-00064 (granted May 3, 2017) (the “May 3 STA”). On March 31, 2017, the FCC granted Iridium STA for 30 days to keep one satellite in a storage orbit. See Iridium Constellation LLC, SAT-STA-20170223-00020 (granted Mar. 31, 2017) (the “March 31 STA,” and together with the May 3 STA, the “30-day STAs”).

<sup>2</sup> See 47 C.F.R. § 25.120(b)(4). On April 21, Iridium also filed a request for 180-day STA, which the FCC placed on Public Notice May 5, 2017. See Public Notice, Report No. SAT-01235. In addition, Iridium will file a request for modification of its license to cover use of the storage orbit for the entire constellation replacement based upon the information and experience it gains from the replacement of Block 1 satellites with Iridium NEXT satellites in these first few launches.

Grant of the STA serves the public interest. Iridium is engaged in the unprecedented endeavor of deploying an entirely new global satellite constellation at the same time it retires an older global satellite system. During this transition, it is imperative that Iridium have the most robust among its satellites in operation at all times and that any less robust satellites be taken out of service and deorbited first. It is also important that Block 1 satellites be available to provide service if a new satellite develops any unexpected temporary communication problems. Providing Iridium with the flexibility to maneuver its healthiest Block 1 satellites to a storage orbit will ensure the availability of sufficient engineering resources to coordinate the safe movement of Iridium's satellites during the deorbiting process and eliminate the risk that this unique replacement effort will have any adverse impact on Iridium service. Until a particular plane is fully populated with operational Iridium NEXT mission satellites and spares, only Block 1 spares can serve this purpose. The first-generation satellites Iridium seeks to keep in-orbit will be the least likely to suffer an anomaly that would hinder them from being deorbited as required by, and without any change to, the previously approved orbital debris mitigation plan.<sup>3</sup>

#### **I. BACKGROUND AND REQUEST FOR SPECIAL TEMPORARY AUTHORITY**

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.<sup>4</sup> On August 1, 2016, the Commission authorized Iridium to construct, deploy and operate its second-generation satellite constellation, commonly known as Iridium NEXT, with 66

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<sup>3</sup> See *Iridium Constellation LLC Application for Modification of Big LEO License to Change the Orbital Debris Mitigation Plan*, 29 FCC Rcd 9422 (I.B. 2014).

<sup>4</sup> See *Application of Motorola Satellite Communications, Inc.*, Order and Authorization, 10 FCC Rcd 2268, ¶ 25 (IB 1995).

space stations and up to 15 “second-generation in-orbit satellites.”<sup>5</sup> Specifically, the grant “is based on a planned one-for-one substitution of first-generation satellites by second-generation satellites, but does not preclude Iridium seeking authorization at a later date to retain some first-generation satellites as spares.”<sup>6</sup>

This 30-day STA seeks authority to continue to retain up to four first-generation satellites in a storage orbit upon their substitution by a second-generation satellite. Iridium began its phased launch of second-generation satellites with the successful launch and delivery of 10 satellites to a temporary 625 km parking orbit in January 2017.<sup>7</sup> Following positioning to the 780 km mission orbit and completion of in-orbit testing, second-generation satellites from this and subsequent launches will be brought into operation and replace first-generation satellites in specific orbital planes and slots. Under the 30-day STAs, Iridium moved certain of the replaced first-generation satellites to a storage orbit of approximately 760 km. There, these first-generation satellites serve as spares to support Iridium’s phased deployment of Iridium NEXT. While positioned in storage orbit, the first-generation satellites will not be co-located and will not operate as part of Iridium’s mission constellation.<sup>8</sup>

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<sup>5</sup> See generally *Iridium Constellation LLC, Application for Modification of License to Authorize a Second-Generation NGSO MSS Constellation*, Order and Authorization, 31 FCC Rcd. 8675, ¶¶ 45-47 (Aug. 1, 2016) (“Iridium NEXT Order”).

<sup>6</sup> *Id.*, ¶ 5 n.22.

<sup>7</sup> *Iridium Announces Successful First Launch of Iridium NEXT Satellites*, Iridium.com (Jan. 14, 2017), available at <http://investor.iridium.com/releasedetail.cfm?releaseid=1007978>. The second payload of ten Iridium NEXT satellites is targeted for launch on Jun 29, 2017. See *Iridium Announces Successful Completion of First-Launch Iridium NEXT Satellites Activities and Second Launch Date* (May 2, 2017), available at <http://investor.iridium.com/releasedetail.cfm?ReleaseID=1023920>.

<sup>8</sup> *Cf.* File No. SAT-MOD-20120813-00128.

Iridium's decision about which satellites to replace first is based on the overall health and safety of the operating constellation. With each launch, ten Iridium NEXT satellites go to one of the six planes where the Iridium constellation operates. The first launch was to plane number 6, primarily because there was an open slot (i.e., a slot where there was no operating satellite). Because Iridium's launch provider can deliver ten satellites at a time to a given orbital plane, there will be Block 1 satellites replaced early in the process that remain healthy with ample fuel and thus would be useful as spares. Under the 30-day STAs, Iridium placed in storage orbit satellites whose communications and other systems remain well-functioning and that have enough fuel to (a) move to a storage orbit, (b) move back into a mission orbit if needed, and (c) deorbit after they were no longer needed in the mission orbit.

As a result of the first launch, and under the 30-day STAs, Iridium has moved four replaced first generation satellites to the temporary storage orbit and deorbited three satellites immediately from mission orbit.<sup>9</sup> Of the satellites temporarily placed into storage orbit, SV077 will be deorbited as soon as safely possible based on the availability of engineering resources and experience gained from the Iridium NEXT operations, which is anticipated to be in approximately 1-2 months. The remaining three satellites in the storage orbit would be maintained as spares for a longer period of time pending of the successful launch and operation of additional Iridium NEXT satellites. The plan for each subsequent plane will be similar.

## **II. PUBLIC INTEREST STATEMENT**

### **A. Grant of this STA Request Will Serve the Public Interest.**

As the Commission has acknowledged, Iridium NEXT will "provide mobile voice and data services to end users on a network with improved voice quality and enhanced data

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<sup>9</sup> In the first launch, one Iridium NEXT satellite filled a vacant slot and two others are drifting to an adjacent plane.

transmission speeds.”<sup>10</sup> Allowing Iridium the flexibility sought in this STA will backstop Iridium’s phased transition to Iridium NEXT and its provision of these beneficial service enhancements. Use of the storage orbit will also provide time separation between the de-orbits and ensure the availability of engineering resources needed to coordinate the safe movement of multiple satellites.

Moreover, the storage orbit and request to maneuver first-generation satellites is temporary, and the satellites Iridium chooses for use as spares will be those with the highest-functioning systems on all measures. As Iridium subsequently launches second-generation satellites, Iridium will de-boost and de-orbit the first-generation satellites on a rolling basis. When the entire Iridium NEXT constellation and spares have been launched, tested and demonstrated to be operating successfully, the need for Block 1 satellites in-orbit will cease.

Grant of this STA request also poses no interference risk. The proposed location of the first-generation spare satellite orbit ensures safe station-keeping without any overlap in orbital position. Further, upon replacement by a second-generation satellite in the mission constellation, a first-generation satellite will suspend mission operations and will not be co-located and operated in tandem with the second-generation satellite.

**B. Iridium Will Continue to Comply with the Approved Orbital Debris Mitigation Plan.**

In 2014, the Commission issued a revised orbital debris mitigation plan for Iridium’s Block 1 satellites.<sup>11</sup> Under the revised plan, the agency allowed Iridium to extend the post-mission atmospheric re-entry period to 25 years for up to ten satellites, while the rest of the Block 1 fleet remained subject to the one-year re-entry period approved in 2002. Iridium has

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<sup>10</sup> Iridium NEXT Order, ¶ 1.

<sup>11</sup> *See generally* Revised Orbital Debris Order.

abided by this plan. In June 2016, Iridium removed SV039 from its mission orbit for purposes of deorbit and filed the required notification to the FCC.<sup>12</sup> Iridium has since deorbited three Block 1 satellites replaced by Iridium NEXT satellites and timely filed the required notifications to the FCC.

The flexibility sought by this STA will not affect Iridium's continued compliance with its existing orbital debris mitigation plan. Specifically, Iridium will deorbit no more than ten Block 1 satellites under the approved atmospheric re-entry period of up to 25 years. Iridium will use all available fuel to achieve the lowest perigee altitude possible for each deorbited satellite. Indeed, Iridium anticipates that many of the ten satellites approved for an atmospheric re-entry period of up to 25 years will actually achieve a perigee altitude resulting in a significantly faster atmospheric re-entry period of a few years. As stated above, Iridium will keep only the most robust Block 1 satellites in storage orbit following their replacement by Iridium NEXT satellites. These Block 1 satellites will be the least likely to suffer an anomaly that would diverge from the approved orbital debris mitigation plan. In sum, Iridium will continue to comply fully with its existing, approved deorbit plan.

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<sup>12</sup> See Letter from Maureen C. McLaughlin, Iridium to Mr. Jose Albuquerque, Chief, Satellite Division, International Bureau, Federal Communications Commission (June 29, 2016).

**III. CONCLUSION**

Iridium respectfully requests that the Commission grant this 30-day STA to permit Iridium to retain up to four first-generation satellites in a temporary storage orbit.

Respectfully submitted,

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