

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

In the Matter of)	
)	
Iridium Constellation LLC)	File No. SAT-MOD-2017 _____
)	
Application for Modification of)	
Authorization (Call Sign S2110))	
)	

**APPLICATION OF IRIDIUM CONSTELLATION LLC
FOR SPECIAL TEMPORARY AUTHORITY**

Iridium Constellation LLC (“Iridium”) holds special temporary authority (“STA”) from the Commission to keep up to twelve first-generation (“Block 1”) satellites in a temporary 760 km storage orbit and to maneuver first-generation satellites to replace other first-generation satellites on a temporary basis (the “180-day STA”), which will expire on December 4, 2017.¹ On October 30, 2017, Iridium sought authority to modify the authorization for its “Big LEO” band non-geostationary satellite orbit (“NGSO”) constellation (call sign S2110) by (1) extending the Block 1 license term until July 31, 2019; (2) maintaining up to eighteen Block 1 satellites in a storage orbit; and (3) maneuvering Block 1 satellites within the constellation, as needed (the “Modification Application”).² As the Modification Application likely will remain pending beyond the expiration of the 180-day STA, Iridium hereby requests STA for up to an additional sixty (60) days, beginning December 5, 2017, for the same authority sought in the Modification Application.³

¹ See Iridium Constellation LLC, SAT-STA-20170421-00065 (granted June 7, 2017) (the “180-day STA”).

² See Iridium Constellation LLC, SAT-MOD-20171030-00146 (filed Oct. 30, 2017) (“Modification Application”).

³ 47 C.F.R. § 25.120(b)(3).

As explained in the Modification Application, grant of this STA serves the public interest by ensuring the continuity of robust service for Iridium’s customers.

I. DESCRIPTION OF THE AUTHORITY REQUESTED

On January 1, 1995, the FCC authorized Iridium’s predecessor-in-interest to launch and operate an NGSO constellation of 66 satellites along with 12 in-orbit spares.⁴ On May 22, 2014, the agency extended the license term for this constellation to January 31, 2018 “based upon Iridium’s description of the planned deployment of its second-generation satellites.”⁵ On August 1, 2016, the Commission authorized Iridium to construct, deploy and operate its second-generation satellite constellation, Iridium NEXT, with 66 space stations and up to 15 “second-generation in-orbit spare satellites.”⁶ 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.”⁷ On June 7, 2017, the agency’s grant of the 180-day STA permitted Iridium to retain up to 12 Block 1 satellites in a 760 km storage orbit for availability as spares and to maneuver its Block 1 satellites within the constellation.⁸ On October 30, 2017, Iridium sought permanent authority to retain up 18 Block 1 satellites in a storage orbit and maneuver Block 1 satellites within the

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

⁵ Iridium Constellation LLC, Stamp Grant, File No. SAT-MOD-20101001-00207 (granted in part May 22, 2014).

⁶ *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 (2016) (“Iridium NEXT Order”).

⁷ *Id.*, ¶ 5 n.22.

⁸ See 180-day STA.

constellation. In addition, Iridium sought to extend the Block 1 license term until June 30, 2019.⁹

First, by the Modification Application and the instant STA, Iridium seeks authority to maintain the engineering flexibility enabled by the 180-day STA throughout the launch of the Iridium NEXT constellation by keeping as many as 18 Block 1 satellites in a storage orbit upon their substitution by a second-generation satellite. After arriving in the 780 km mission orbit and completing in-orbit testing, second-generation satellites replace first-generation satellites in specific orbital planes and slots. Under the 180-day STA, Iridium has moved some of the replaced first-generation satellites to a storage orbit of approximately 760 km. There, these first-generation satellites can 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 be part of Iridium's operational constellation.¹⁰

Iridium's decision about which satellites to replace first is based on the overall health and safety of the operating constellation. With each launch, up to ten Iridium NEXT satellites go to one of the six planes in which the Iridium constellation operates. Because Iridium's launch provider can deliver ten satellites at a time to a given orbital plane, some Block 1 satellites that are operating most efficiently and have ample fuel will be replaced early in the process, and thus would be useful as spares. Iridium intends to place in storage orbit satellites whose communications and other systems are functioning well, and that have enough fuel to (a) move to a storage orbit, (b) move back into a mission orbit if needed, and (c) deorbit in a timely way after they are no longer needed in the mission orbit.

⁹ See Modification Application.

¹⁰ Cf. File No. SAT-MOD-20120813-00128.

Second, the Modification Application and the instant STA seek continuing authority, as granted in the 180-day STA, to maneuver certain Block 1 satellites, after replacement by Iridium NEXT satellites, to a new slot where they will replace less robust first-generation satellites.

Finally, the Modification Application requested authority to extend its Block 1 license term to July 31, 2019. The Commission first set the January 31, 2018 Block 1 expiration date in May 2014. Since then, circumstances beyond Iridium's control, such as delays with components and launch providers,¹¹ pushed back the anticipated launch schedule, and Iridium requires more time to complete the complex transition to Iridium NEXT. This STA requests that the Block 1 license term be extended until grant of the Modification Application, or, if the Modification Application remains pending, until the instant STA request expires.

II. GRANT OF THE STA WILL SERVE THE PUBLIC INTEREST

As the Commission has said, Iridium NEXT will “provide mobile voice and data services to end users on a network with improved voice quality and enhanced data transmission speeds.”¹² Allowing Iridium the flexibility sought in this STA will backstop Iridium's phased transition to Iridium NEXT and its provision of these service enhancements. Use of the storage orbit will also provide time separation between the deorbits of the first-generation satellites 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

¹¹ Peter B. de Selding, *Component Issue Delays Iridium Next Launches by Four Months*, Spacenews.com (Oct. 29, 2015), available at <http://bit.ly/2yM6AzX>; Briang Berger and Jeff Foust, *SpaceX Falcon 9 rocket and Amos-6 satellite destroyed during static-fire test*, Spacenews.com (Sept. 1, 2016), available at <http://bit.ly/2gfiZpb>.

¹² Iridium NEXT Order, ¶ 1.

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.

In the same way, extending Iridium's Block 1 license term serves the public interest. Iridium began its phased launch of second-generation satellites with the successful launch and delivery of 10 satellites in January 2017. Since then, Iridium has successfully launched 20 additional satellites—10 in June 2017 and 10 in October 2017—and expects additional launches every few months until the entire constellation is in orbit. Grant of the extension, in combination with the storage orbit and maneuverability authority sought herein, will provide Iridium's engineers with the flexibility to continue to complete the extraordinary transition to Iridium NEXT safely and efficiently, and will ensure continuity of service for Iridium's users, including the critical needs of the U.S. military and the public safety community.

Grant of this STA 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.

III. 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.¹³ Under the revised plan, the agency allowed Iridium to extend the post-mission atmospheric re-entry period to up to 25 years for up to ten satellites, while the rest of the Block 1 fleet remained subject to the up to one-year re-entry period approved in 2002. Iridium has abided by the re-entry periods set forth in this plan.

¹³ See generally Revised Orbital Debris Order.

The flexibility sought by this STA will not affect Iridium's continued compliance with its existing orbital debris mitigation plan. Specifically, Iridium will continue to comply with its authority to 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 achieve a perigee altitude resulting in atmospheric re-entry in just a few years. Similarly, Iridium anticipates that many of the remaining satellites permitted to deorbit in up to a one-year period will achieve a perigee altitude resulting in atmospheric re-entry within mere months.

As noted, Iridium will keep only a limited number of 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.

IV. CONCLUSION

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

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