



Federal Communications Commission
Washington, D.C. 20554

June 10, 2015

Mr. Thomas Hickey
Iridium Constellation LLC
1750 Tysons Boulevard
Suite 1400
McLean, VA 22102

Re: Iridium Constellation LLC Application for Modification of NGSO
Authorization to Launch and Operate Second-Generation Satellites
IBFS File No. SAT-MOD-20131227-00148, Call Sign S2110

Dear Mr. Hickey:

On December 27, 2013, Iridium Constellation LLC (Iridium) filed an application to modify its license for a "Big LEO" non-geostationary orbit Mobile-Satellite Service constellation to launch and operate second-generation satellites. The application includes a plan to mitigate the creation and effects of orbital debris.¹ To aid the Commission's evaluation of the orbital debris mitigation plan, please provide the following supplemental information:

1. Iridium proposes to relocate second-generation satellites at end of life to a disposal orbit with an apogee altitude of 750 km and a perigee altitude of 500 km.² For this disposal orbit and for alternative disposal orbits with the same apogee altitude and perigee altitudes of 450 km, 400 km, 350 km, 300 km, and 250 km, state:
 - a. The predicted amount of time the satellite will remain in orbit following placement into the disposal orbit;
 - b. the probability of accidental collision with space objects larger than 10 cm in diameter during that time period; and
 - c. the effect, if any, on duration of the communications mission or on the satellite's mission capabilities in the event perigee altitudes of the disposal orbits are reduced below the proposed 500 km.

¹ See Application, Exhibit C; see also Letter from Jennifer D. Hindin, Counsel for Iridium Constellation LLC, to Marlene H. Dortch, Secretary, FCC, at 1-2 (filed May 15, 2014) (disclosing mass-to-area ratio of Iridium second-generation satellites); Letter from Jennifer D. Hindin, Counsel for Iridium Constellation LLC, to Marlene H. Dortch, Secretary, FCC (filed Dec. 4, 2014) (clarifying mass-to-area ratio calculation) (December 2014 Letter); Letter from Jennifer D. Hindin, Counsel for Iridium Constellation LLC, to Marlene H. Dortch, Secretary, FCC (filed Oct. 29, 2014) (supplementing casualty risk assessment).

² See Application, Exhibit C at 6-7.

2. For the cases of a failed second-generation satellite in the 625 km circular insertion orbit³ or in the 778 km circular mission orbit, state the predicted amount of time the satellite will remain in orbit and the probability during that time of accidental collision with space objects larger than 10 cm in diameter.
3. The application Schedule S indicates that the probability of survival to end of life of a second-generation spacecraft is 0.92 for the satellite bus.⁴ Please provide the basis for this estimate. Is 0.08 the expected catastrophic failure rate for operational satellites? Does the 0.92 probability of success also include the disposal operations specified in the application? If not, please provide the probability of success of the disposal plan and the basis for the estimate.
4. An affiliate of Iridium currently maintains an insurance policy to cover the de-orbiting of the Iridium first-generation constellation, with the U.S. government as a named beneficiary.⁵ Will an insurance policy be procured to cover de-orbiting of the second-generation satellites? If so, will the policy include the U.S. government as a beneficiary?⁶ Will the second-generation satellites be covered by an insurance policy for third party liability for events occurring throughout the period during which a satellite remains in orbit?
5. The application states that a casualty risk assessment was conducted using the National Aeronautics and Space Administration Debris Assessment Software (DAS).⁷ What was the casualty risk output in DAS from this assessment? When Iridium second-generation mission information is entered into DAS, does the software indicate that the mission is compliant with each of the relevant items in the "Requirement Assessments" window? If not, please specifically identify any such items.
6. Iridium states that "[a]s part of the de-orbit process, the satellite's solar arrays will be positioned to maximize the minimum drag surface for atmospheric re-entry."⁸ Please provide further explanation. Will this disposal configuration minimize collision risk, remaining orbital lifetime, or both?

³ See Application, Engineering Statement at 9.

⁴ See Application, Schedule S, Item S15j.

⁵ See Iridium Communications Inc., SEC Form 10-K at 16 (Feb. 26, 2015).

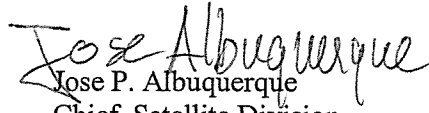
⁶ Under international law, the U.S. government could potentially be held liable for certain damage that may result from private space station operations, including disposal, maneuvering, and the generation of orbital debris. See *Mitigation of Orbital Debris*, IB Docket No. 02-54, Second Report and Order, 19 FCC Rcd 11567, 11612-14, ¶¶ 109-13 (2004).

⁷ Application, Exhibit C at 8.

⁸ December 2014 Letter.

Please provide the requested information by July 31, 2015.⁹

Sincerely,


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cc:

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⁹ See 47 C.F.R. § 25.112(c).