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

In the Matter of	)	
	)	
Comprehensive Review of Licensing and Operating Rules for Satellite Services	)	IB Docket No. 12-267
	)	

COMMENTS OF IRIDIUM CONSTELLATION LLC

Iridium Constellation LLC ("Iridium") hereby comments on the Further Notice of Proposed Rulemaking in the above-captioned proceeding (the "FNPRM").[1] Iridium appreciates the Commission's recognition of the evolution of satellite technology and services, and it is gratified by the FCC's continuing efforts to modernize and simplify the Part 25 rules. Iridium supports the positions taken in the comments of the Satellite Industry Association ("SIA"), of which it is a member. Iridium is submitting these comments to present its views on matters not addressed by SIA and to emphasize its support for certain SIA positions.

1. The Commission should initiate a proceeding to consider the regulatory issues posed by small satellite networks

In 2013, the Commission released a public notice that provided guidance on obtaining licenses for small satellites, including satellites that fall within the categories of picosatellites, nano-satellites and cubesats.[2] The public notice stated that authority for small satellites could be sought under the three FCC rule parts that apply to satellite licensing generally: Part 25, Part 5, and Part 97.

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[1] *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, Further Notice of Proposed Rulemaking, IB Docket No. 12-267, FCC 14-142 (rel. Sept. 30, 2014) ("*FNPRM*").
[2] Public Notice, "Guidance on Obtaining Licenses for Small Satellites," DA 13-445 (rel. March 15, 2013).

Since that time, the number of small satellite networks has exploded, and it has become apparent that the unique nature of small satellites may necessitate special regulatory consideration. Iridium, therefore, supports the suggestion in the comments filed by SIA that the Commission initiate a separate proceeding to consider the regulatory treatment of these satellites.

Small satellites pose multiple regulatory challenges. Many small satellites are launched as secondary payloads. So it is frequently the case that their launch plans are not known well in advance. In addition, most small satellites lack propulsion systems for end-of-life maneuvers and have limited ability to maneuver to avoid collision. As a result, they pose a risk of physical harm to existing NGSO networks, which is of great concern to operators of low earth orbit satellites such as Iridium.

The following questions would be appropriate for consideration in a small satellite proceeding:

- Should all small satellite applications (experimental, amateur or commercial) be placed on public notice, and not just the ones that fall within Part 25, to ensure the Commission has complete information and to facilitate the protection of assets currently in orbit?
- Should there be an online registry for small satellite operators to provide anticipated launch dates and orbital parameters and final launch dates and orbital parameters?
- What should the de-orbit requirements be for small satellites and what orbital debris considerations should be taken into account?
- As small satellite networks proliferate, should there be a process for coordination of orbits?
- How will the physical protection of assets currently in orbit be ensured, since many of the satellites do not have maneuvering capabilities?

2. TT&C transmissions that are not at band edge should be permitted

The Commission tentatively concluded in the *FNPRM* that "it would serve the public interest to permit licensees to transmit non-emergency TT&C signals in portions of their assigned spectrum other than at the band edges, provided that such TT&C operation will cause

no more interference or require greater protection from interference than ordinary communications traffic on the same satellite network."[3] The Commission proposed to amend Section 25.202(g) to reflect this change.[4]

Iridium supports the Commission's proposal. Permitting non-emergency TT&C transmissions that are not at band edge will provide satellite operators with added flexibility in meeting the needs of the public. Limiting these transmissions to cases in which no more interference is caused, and no greater protection is required, than for ordinary communications means that the rule change will not affect the interference environment. Adopting the proposed change, therefore, is in the public interest.

3. The Commission should retain its two-degree spacing policy for the 29.25-29.5 GHz band

In the *FNPRM*, the Commission sought comment "on a broader recommendation from Intelsat to eliminate the two-degree spacing policy and instead rely on ITU filing priority as the basis for protection rights and coordination requirements as between GSO FSS systems licensed by the Commission or authorized for U.S. market access."[5] Iridium opposes this proposal as it would apply to the 29.25-29.5 GHz band.

The Commission has adopted a band plan for the 18.3-20.2/28.35-30.0 GHz band that differs from the international allocation plan. Under the Commission's band plan, in the United States GSO FSS stations and NGSO MSS feeder links are co-primary in the 29.25-29.5 GHz band and must coordinate under the U.S. domestic coordination procedures established by Section 25.258 of the Commission's rules. U.S. domestic coordination procedures are based on FCC filing priority, not ITU filing priority. It would be inappropriate, therefore, to apply ITU

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[3] *FNPRM*, ¶ 187.
[4] *Id.*
[5] *FNPRM*, ¶ 35.

filing priority to U.S. domestic coordination between GSO FSS earth stations and NGSO MSS feeder links that operate in the 29.25-29.5 GHz band.

4. The cross-polarization isolation requirement should be eliminated

The Commission has proposed to eliminate the requirement in Section 25.210(i)(1) of the rules that space station antennas used for FSS operation provide cross-polarization isolation of at least 30 dB within the primary coverage area. Iridium supports this proposal.

In response to the *2012 NPRM* in this proceeding,[6] SIA asked that the Commission eliminate the requirement because cross-polarization isolation generally has no bearing on inter-system interference. The Commission refrained from ruling on SIA's request at the time only because "no commenter had provided a technical analysis that satellite analog video transmissions would be adequately protected if the cross-polarization requirement were eliminated."[7] As the Commission recognized in the *FNPRM*, however, "analog transmissions are routinely coordinated between operators and have become infrequent."[8] The Commission, therefore, proposed to eliminate the cross-polarization isolation requirement, and Iridium concurs with this proposal.

5. Increases in the number of blanket-licensed earth stations should be permitted without prior FCC approval only if the authorized operation has primary status

The Commission invited comment in the *FNPRM* on "amending Section 25.118(a)(3) to state that a licensee may increase the number of earth stations operating under a blanket license without prior authorization unless the license specifies a limit on the number of operating

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[6] *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, IB Docket No. 12-267, Notice of Proposed Rulemaking, 27 FCC Rcd 11619 (2012).
[7] *FNPRM*, ¶ 181.
[8] *FNPRM*, ¶ 181.

stations."[9] The Commission also asked whether "Sections 25.115(e) and (f) should accordingly be amended to eliminate provisions that require all applicants for blanket licenses for 20/30 GHz VSAT networks or Ku-band NGSO FSS earth station networks to specify a maximum number of user terminals proposed for operation."[10]

These requests for comment are based on a proposal made by SIA in an earlier phase of this proceeding.[11] SIA's proposal was limited to primary bands, and the organization took no position as to what rule should apply in the case of operations on a secondary or non-conforming use basis.[12]

Iridium supports the changes to Sections 25.118(a)(3) and 25.115(e) and (f) that are discussed in the *FNPRM* in the case of licensed operations for which there is a primary allocation and opposes the changes in the case of licensed operations for which there is only a secondary allocation or no allocation. Authorizations that have been issued on a secondary or non-conforming use basis for blanket-licensed, mobile, and VSAT earth terminals frequently are premised on an interference analysis that is tied to a maximum number of earth terminals. Given these circumstances, it would be inappropriate to increase the number of secondary or non-conforming use earth terminals above authorized levels without first providing a revised interference analysis, in a major modification application, that the Commission can review and interested parties can address. Allowing the number of earth terminals to be increased without revisiting the underlying interference analysis could undermine the basis on which the original license was granted.

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[9] *FNPRM*, ¶ 149.
[10] *Id.*
[11] Comments of the Satellite Industry Association, IB Docket No. 12-267 (Jan. 14, 2013) at 36.
[12] *Id.*

6. Any rules permitting GSO FSS ITU submissions before a full space station application is filed should apply to NGSO FSS and NGSO MSS, too, and parties should have six months to file a full space station application

In the *FNPRM*, the Commission made various proposals for submitting Advance Publication Information and Coordination Requests for GSO FSS space stations to the International Telecommunication Union ("ITU") before full license applications are filed with the Commission.[13] Iridium hereby comments on two elements of these proposals.

First, Iridium supports the proposal in SIA's comments that any rule changes in this area should extend to NGSO FSS and NGSO MSS space stations as well as GSO FSS space stations. The rationale for changing the rules for GSO FSS space stations also applies to making these changes for NGSO FSS and NGSO MSS space stations, including NGSO MSS feeder links.

Second, Iridium opposes the proposal to give parties two years to file a full FCC application once Advance Publication and Coordination Request information has been submitted to the ITU.[14] Iridium proposes instead that parties be required to file a full FCC application within six months. A six-month period should provide sufficient time to develop a full application. A two-year period, on the other hand, would provide opportunities to warehouse spectrum and could deter efforts to pursue spectrum by parties with legitimate spectrum needs. A six-month period strikes the right balance between these competing considerations.

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[13] *See* NPRM at 4-8, ¶¶ 5-18.
[14] *See* FNPRM at 7, ¶ 14.

7. The requirement for discharging stored energy sources at end-of-life should be modified

In the *FNPRM*, the Commission requested comment on refinements to the requirement in Section 25.283 of the rules that all stored energy sources be discharged at end-of-life.[15] Iridium supports modification of the requirement.

As stated in the *FNPRM*, the design of one commonly-used spacecraft that has been in use for many years does not allow for complete venting of spacecraft energy sources.[16] Operators employing this spacecraft have had to seek waivers even though the spacecraft has a proven safety record and the waivers have been granted as a matter of course. To provide additional flexibility while maintaining safety, Iridium proposes a modified requirement under which excess reactive propellants would have to be vented at end-of-life to the minimum residuals reasonably possible and inert propellants would have to be vented at end-of-life by relieving pressure vessels to no more than 20 percent of the system burst pressure.

8. Type approval procedures for 20/30 GHz VSATs, if adopted, should not apply to the 29.25-29.5 GHz band that is shared with NGSO MSS feeder links

The *FNPRM* seeks comment on amending Section 25.134 of the rules to establish a type approval procedure for Ku-band and 20/30 GHz VSAT earth stations. Under one variation of this procedure, applicants for Ku-band and 20/30 GHz VSAT earth stations operating "within a limit of 50 dBw on peak EIRP" could "omit all other technical specifications and merely certify that the proposed operation will be in compliance with all applicable Commission rules."[17] Another variation would permit use of standards-based testing similar to what is used in Europe.[18]

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[15] *FNPRM* at 57-58, ¶ 199.
[16] *Id.*
[17] *FNPRM* at 30, ¶ 86.
[18] *FNPRM* at 30, ¶ 87.

Iridium takes no position on this procedure generally. If the procedure is adopted, however, it should not apply to VSATs or any other blanket licensed earth stations operating in the 29.25-29.5 GHz band. GSO FSS stations, including VSAT stations, share that band on a co-primary basis with NGSO MSS feeder links, and pursuant to Section 25.258 of the rules, GSO FSS earth stations in the band must be coordinated with NGSO MSS feeder links case-by-case. Type approval procedures, by their nature, are incompatible with case-by-case coordination. Accordingly, type approval should not be permitted for VSATs or any blanket licensed earth stations in the 29.25-29.5 GHz band.

9. The definition of 20/30 GHz bands should be limited to GSO FSS primary bands

As stated in the *FNPRM*, some parts of the 18.3-20.2/28.35-30.0 GHz band are designated as primary for GSO FSS stations and other parts are designated as primary or co-primary for NGSO FSS stations, NGSO MSS feeder links, and terrestrial stations. At present, the definition of 20/30 GHz band in the rules encompasses the entire band. The Commission proposed in the *FNPRM* to limit the 20/30 GHz band definition to the 18.3-18.8 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), 28.35-28.6 GHz (Earth-to-space), and 29.25-30.0 GHz (Earth-to-space) sub-bands. GSO FSS earth stations have primary status in these sub-bands, and applications for GSO FSS earth stations in the sub-bands are eligible for routine processing if they satisfy the requirements of Section 25.138.

Iridium supports the Commission's proposal. GSO FSS earth stations that have primary or co-primary status and that are eligible for routine processing raise different regulatory considerations than NGSO FSS earth stations, NGSO MSS feeder link earth stations, and terrestrial stations. It makes regulatory sense, therefore, to have a separate definition for the sub-bands in which GSO FSS earth stations are primary. And Iridium agrees with the statement in

SIA's comments that "conventional GSO Ka-bands" would be a more accurate title for this definition than "20/30 GHz band."

The 20/30 GHz band definition (or the conventional GSO Ka-bands definition), once it is limited to the sub-bands in which GSO FSS earth stations have primary or co-primary status, also should be limited to GSO FSS earth stations that operate in the sub-bands. It would be inappropriate to apply the service rules for primary GSO FSS earth stations to other stations that operate in the sub-bands on a secondary or non-conforming basis.[19] Also, separate definitions should be developed for NGSO FSS and NGSO MSS feeder links.

CONCLUSION

In view of the foregoing, the Commission should initiate a proceeding to consider the regulatory issues posed by small satellite networks and should make the changes to Part 25 of its rules that are proposed herein and in the comments filed by SIA.

Respectfully submitted,

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[19] The technical sufficiency of proposals to operate on a secondary or non-conforming use basis needs to be evaluated case-by-case, and not by reference to service and technical rules that were adopted with primary services in mind.