

## TECHNICAL DETAILS

General Dynamics hereby makes a demonstration pursuant to Section 25.258 of the Commission's rules<sup>1</sup> as to how its proposed NGSO MSS earth station in Honolulu, which will use the 29.25-29.3 GHz portion of the 29.25-29.5 GHz band over the Iridium satellite system, can share with geostationary orbit ("GSO") fixed satellite service ("FSS") earth stations operating in the 29.25-29.5 GHz band.

General Dynamics has followed the guidelines set forth in ITU-R Recommendation S. 1419, "Interference Mitigation Techniques to Facilitate Coordination Between non-GSO MSS Feeder links and GSO FSS networks in the bands 19.3-19.7 GHz and 29.1-29.5 GHz," a copy of which is attached.

The following factors will make sharing possible:

- **Use of uplink power control:** General Dynamics has 30 dB of power control for use on its uplink transmissions.
- **Use of high gain (i.e., small beam width) antennas:** General Dynamics will be using very high gain earth station antennas having uplink beam widths of only 0.24 degrees.
- **Geographic Isolation:** ITU-R Recommendation S. 1419 refers to a separation of two degrees of latitude, which is approximately 225 km. General Dynamics' Honolulu earth station will be located at least 500 km from any GSO FSS earth station that the Commission has licensed in the 29.25-29.5 GHz band.
- **Path loss:** There is a path loss difference of 33 dB between the geostationary orbit and Iridium's non-geostationary orbits.

In light of these factors, General Dynamics' Honolulu earth station will be able to share with GSO FSS earth stations operating in the 29.25-29.5 GHz band. The narrowness of General Dynamics' uplink beam width provides for a very short duration GSO arc crossing event. Using a two degree interference zone around the GSO arc, an Iridium satellite moving at 7.5 km/s takes less than five seconds to pass through the GSO arc, and crossings will occur about once every two hours. Consequently, crossings will be limited to 0.07% of the time.<sup>2</sup> The limited time during which there are geostationary orbit crossings, the use of power control, the GSO/NGSO path loss, and the geographic separation described above ensure that there will be satisfactory sharing between General Dynamic's NGSO MSS earth stations and GSO FSS earth stations in the 29.25-29.5 GHz band.

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<sup>1</sup> 47 C.F.R. § 25.258.

<sup>2</sup> 5 seconds/7200 seconds = 0.07%.