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January 29, 2003

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FEDERAL COMMUNICATIONS COMMISSION
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Policy Branch
International Bureau

By Hand Delivery

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
The Portals
445 12th Street, S.W., Room TW-A325
Washington, D.C. 20554

Re: ICO Satellite Services G.P.
Supplemental Orbital Debris Mitigation Statement
File No. 188-SAT-LOI-97; IBFS Nos. SAT-LOI-19970926-00163 *et al.*

Dear Ms. Dortch:

Pursuant to Paragraph 22 of the order reserving 2 GHz mobile satellite service spectrum for the predecessor-in-interest of ICO Satellite Services G.P. ("ICO"),¹ ICO submits this supplemental information regarding mitigation of orbital debris.

The *ICO LOI Order* required ICO to "provid[e] greater specificity regarding the range of storage orbit parameters selected for disposal of its satellites."² ICO believes that it provided sufficient information in its orbital debris mitigation statement, which specified that each satellite "will be maneuvered into a storage orbit above its operational orbit" and "[i]n this storage orbit, the satellite will not interfere with future space operations."³ ICO nonetheless supplements its

¹See *ICO Services Limited*, 16 FCC Rcd 13762, 13770-71 ¶ 22 (IB/OET 2001) ("*ICO LOI Order*").

² *Id.*

³ See Second Amendment to ICO Services Limited Letter of Intent, App. G, at 10 (Nov. 3, 2000). Under Section 6-2(b) of the National Aeronautics & Space Administration/Department of Defense Guidelines regarding assessment procedures for limiting orbital debris, disposal for final mission orbits with perigee altitudes above low earth orbit ("LEO") at 2,000 kilometers may be accomplished by maneuvering to a storage orbit anywhere between LEO and geostationary earth orbit. See *Guidelines and Assessment Procedures for Limiting Orbital Debris*, NSS 1740.14, § 6-2(b) (Aug. 1995) ("NASA/DoD Guidelines"). Based on Figure 6-1 of the NASA/DoD Guidelines, ICO's six-hour MEO may be considered as a "Low-Altitude Storage Orbit" (i.e., an orbit at least 500 kilometers above LEO). Thus, ICO's plan to move each

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debris mitigation statement to specify that it will boost each satellite at the end of its operational life to a storage orbit of approximately 10,690 kilometers, or 300 kilometers above the nominal ICO MEO orbit.

The *ICO LOI Order* also notes that ICO and other 2 GHz MSS operators should “develop appropriate operational plans and procedures to minimize the probability of collision with large, known objects during satellite orbital lifetime.”⁴ According to the NASA/DoD Guidelines, the probability of collision with large, known objects for spacecraft in medium earth orbit (“MEO”), such as ICO's six-hour orbit at 10,390 kilometers, is zero.⁵ Under Section 5-1 of the NASA/DoD Guidelines, when the probability of collision with large, known objects is less than 0.001, the intent of the guidelines has been met.

It is unclear whether the *ICO LOI Order* requires ICO specifically to address plans to minimize the probability of collision with large, known objects, particularly where that probability is zero. Nonetheless, in an abundance of caution, ICO supplements its debris mitigation statement to specify that it will consider maintaining an on-going situational awareness capability, with a view to providing adequate and timely warning of the risk of collision posed by tracked objects in space intersecting ICO's orbit, to the extent that appropriate information (i.e., orbit ephemeris data) is available. If necessary, satellite station-keeping maneuvers will be used to minimize the possibility of collision by avoiding intersecting orbits with large, known objects during the lifetime of ICO satellites. Because the risk of collision between ICO spacecraft and large, known objects is virtually non-existent, ICO does not anticipate any need to conduct avoidance maneuvers.

Very truly yours,



Cheryl A. Tritt
Counsel to ICO Satellite Services G.P.

satellite just above MEO at the end of its operational life is in full compliance with the NASA/DoD Guidelines.

⁴ See *ICO LOI Order*, 16 FCC Rcd at 13770 ¶ 22

⁵ Specifically, Section 5-1 (Assessment of Debris Generated by On-Orbit Collisions) of the NASA/DoD Guidelines provides that the probability, P, of an MEO space system colliding with an intact structure or large debris object during its mission life is zero. The instructions for computing this probability specifies that the orbital debris flux, one of the multiplicative terms in the equation for P, is taken to be zero for altitudes above 2000 kilometers.