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April 12, 2004

BY HAND DELIVERY

Mr. Thomas S. Tycz
International Bureau
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20554

RE: L/Q Licensee, Inc., License Modification Application
Call Sign S2115, FCC File No. SAT-MOD-20030606-00098

Dear Mr. Tycz:

This letter is submitted on behalf of L/Q Licensee, Inc. ("LQL"), in response to the questions posed in a letter from you dated March 26, 2004, regarding the proposed orbital debris mitigation plan for the Globalstar Above 1 GHz Mobile-Satellite Service ("MSS") satellite constellation and the request for addition of certain emission designators.

In its orbital debris mitigation plan, LQL proposed to use 1514 kilometers as a graveyard orbit for the Globalstar constellation satellites. LQL explained that the Globalstar satellites were designed to use 1514 km as a graveyard orbit and, therefore, have the appropriate amount of fuel to be disposed of in an orbit of altitude 1514 km. At the time of satellite design, ITT Industries, Systems Division, a subcontractor to Space Systems/Loral, Inc., studied and recommended an altitude for a graveyard orbit of 1500 km because it is relatively undesirable for active telecommunications operations as a result of the adverse radiation environment.

A copy of the ITT recommendation is enclosed. Your questions regarding the orbital debris plan and emission designators are repeated and answered below.

Is it technically feasible to propel Globalstar Big LEO satellites into orbits with perigee altitudes above 2000 kilometers or ensure that they will re-enter the atmosphere within 25 years? If not, please explain why neither of these disposal arrangements is technically feasible and estimate the highest and lowest perigee(s) attainable with current fuel supplies. In answering this question please address *separately satellites that are still fully functional and those that have been removed from an operational orbit due to failure of the main communications payload.*

All the Globalstar satellites were launched with the same fuel tank, and the tank was filled as much as possible. The Globalstar system used two different launch vehicles with different capabilities. Some satellites were injected nearly directly into the 1414 kilometer operational orbit, while others were released into a lower phasing orbit and then moved to that altitude. As a result, the fuel available varies greatly from satellite to satellite.

Sixteen of the 52 satellites in orbit currently have sufficient fuel to meet their expected useful life spans and then to be capable of either being raised to a 2000 kilometer altitude orbit, or being lowered for re-entry. The other 36 satellites do not have sufficient fuel reserves to be raised to 2000 kilometers or to be lowered for re-entry. These 36 satellites have varying fuel reserves which would permit individual satellites be raised to altitudes ranging from 1514 kilometers up to 1900 kilometers.

The two satellites that are currently in the graveyard orbit of 1514 kilometers, pursuant to Special Temporary Authority (see File No. SAT-STA-20040309-00028) have sufficient fuel reserves for raising to 1800 kilometers.

Even though it would be technically possible to lower some of the satellites, the ground system and satellites were not designed for re-entry.

If it is technically feasible to arrange for re-entry of currently functional Globalstar Big LEO satellites within 25 years or place them in disposal orbits with perigees above 2000 kilometers, or at some other altitude above 1514 kilometers or below 1400 kilometers, to what extent would reservation of the fuel required to effect disposal by these means rather than using a disposal orbit at 1514 kilometers, reduce the satellites' remaining service life?

As indicated above, there are fuel reserves on the 52 satellites sufficient to allow the satellites to complete their useful life spans and be raised to orbital altitudes ranging from 1514 kilometers to above 2000 kilometers.

Obviously, reserving sufficient fuel to raise each satellite above 1514 kilometers has an impact on its expected or potential service life. The NASA guidelines were not in place at the time that the Globalstar satellites were designed and at the time that construction, launch and operation of the satellites were authorized by the Commission.

The graveyard orbit of 1514 kilometers was chosen with the best information available at the time. Representatives of the Globalstar system met with NASA to discuss the selection of graveyard orbit, and participated in the NASA study group which created the orbital debris recommendation. However, by that time, the satellites were already in construction and launches had commenced.

The satellites were built with an expected lifespan of 10 years. Although certain anomalies have recurred in the space environment, the satellites have generally performed better than anticipated. As Globalstar is emerging from financial reorganization, the Globalstar system is hoping to obtain as much return as possible from the current satellite constellation. The useful life of the satellites will be preserved for as long as possible.

Currently, the Globalstar system has satellite bus control over all 52 satellites. The two satellites residing at 1514 kilometers are still under control even though the communications payloads have failed. Bus failures can occur which would result in complete loss of control, and preclude raising a satellite even up to 1514 kilometers. Also, as reported recently to the Commission, satellites can experience anomalies which have the effect of uncontrolled expenditure of fuel reserves.

In summary, it is technically feasible to raise most of the satellites above 1514 kilometers. However, such a requirement would limit the extent to which the Globalstar system can make use of the communications payloads on the satellites, and that varies from satellite to satellite given the variations in fuel reserves. Assuming the requested 1514 kilometer graveyard orbit height, we anticipate that most of the satellites have sufficient fuel reserves to remain in use for at least another 20 years. That figure would drop if higher graveyard orbits were required.

The section of the application pertaining to the request for additional emission designators does not include the final output power specifications required by 47 C.F.R. § 25.114(c)(4)(ii), the overall link performance analysis required by 47 C.F.R. § 25.114(d)(4), or the calculation of power flux density levels required by 47 C.F.R. § 25.114(d)(5). We cannot determine which frequency bands would be used for the proposed transmission to aviation receivers, moreover, because the application does not specify channel carrier frequencies.

This application was filed as a modification application of the existing Globalstar satellite constellation. The technical parameters of the satellite system were detailed in the initial application filed on June 3, 1991, amended on November 16, 1994, and on March 8, 1996. All the technical parameters noted above are unchanged from the existing Globalstar system, including the output power specifications and power flux density levels. For your convenience, we have enclosed a chart of the channel frequencies for the L-band and S-band user links.

The link budgets for the simplex and Aviation 1 terminal are the same as those filed in the March 1996 amendment. The link budget for the Aviation 2 terminal is the same as well except that it is a multiple carrier terminal (see MET blanket license modification application filed by Globalstar USA, L.L.C. (File No. SES-MOD-20021010-01758)), which means that there are multiple circuits. Each separate circuit's link budget is the same as those for single circuit terminals.

At the time the modification application was filed, Section 25.117(d) only required submission of technical information that was changing. As noted in the application (Exhibit C), LQL certified that the other technical parameters of the satellites were unchanged with the addition of emission designators.

If we can provide additional information, please let us know.

Respectfully submitted,

William D. Wallace

Of Counsel:

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Enclosures

cc: William Bell (by email)

Engineering Certification

I hereby certify under penalty of perjury that I am the technically qualified person responsible for preparation of the engineering information contained in the foregoing "Letter"; that I am familiar with the relevant sections of the FCC's Rules, the Globalstar Above 1 GHz MSS system application as amended and the proposals set forth in the referenced modification application; and that the information in the foregoing Letter is true and correct to the best of my knowledge and belief.

Signed this 8th day of April 2004.

Paul A. Monte
Director, Systems & Regulatory Engineering
Globalstar L. P.

ITT Industries
Engineered for life

To: Mark Stephenson
From: Mike Fudge
Date: May 19, 1999
Subject: Graveyard Orbit Placement

Given the choice for Globalstar satellite graveyard orbits within the range 1300 km – 1500 km, the best placement would be 1500 km. There are several reasons for this. First of all, given the lack of appreciable drag upon satellites above 1000 km, the possible hazard of graveyarded satellites decaying back down through the active constellation is moot. Second, Teledesic plans to position their constellation at approximately 1375 km, thereby discouraging the choice of a graveyard altitude below that of the active Globalstar constellation (1414 km). The graveyard altitude should be as high as possible given fuel constraints so as to maximize the distance between the graveyarded satellites and the active constellation (mitigating the risk posed by the fragmentation of a graveyarded satellite). The collision risk posed to satellites at 1500 km is slightly lower than at 1460 – 1490 km; however, the general debris flux trend from 1300 km to 1500 km is fairly flat (excepting the hazard posed by trackable objects from 1400 – 1420 km. For the reasons listed above, the preferred altitude for the graveyard orbit (within the range given) is 1500 km.

Service Link Channel Assignments

The corresponding user link frequencies (S-band forward and L-band return) are given in Table 1 below. The frequencies shown are the center carrier frequencies for the Globalstar 1.23 MHz CDMA modulation. The bottom channel edge is found by subtracting 0.615 MHz from the center frequency. The top channel edge is found by adding 0.615 MHz to the center frequency. These are the actual user terminal receive and transmit frequencies that the field devices (user terminals) will have to operate at:

Table 1: User Frequencies at S-Band and L-Band for all Channels (MHz)

Ch No.	S-Band forward	L-Band return
1	2484.390	1610.730
2	2485.620	1611.960
3	2486.850	1613.190
4	2488.080	1614.420
5	2489.310	1615.650
6	2490.540	1616.880
7	2491.770	1618.110
8	2493.000	1619.340
9	2494.230	1620.570
10	2495.460	N/A
11	2496.690	N/A
12	2497.920	N/A
13	2499.150	N/A