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BEFORE THE

Federal Communications Commission
WASHINGTON, D.C. 20554

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

In re: Application of)
)
L/Q LICENSEE, INC.)
)
For Authority to Construct, Launch and)
Operate Globalstar™, a Low-Earth Orbiting)
Satellite System, to Provide Mobile-Satellite)
Services in the 1.6/2.4 GHz Bands.)

File Nos. 90-SAT-ML-96
19-DSS-P-91(48)
and CSS-91-014

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COMMENTS OF TRW INC.

Satellite Policy Branch
International Bureau

TRW Inc. ("TRW"), by counsel, hereby comments on the above-captioned system modification application filed by L/Q Licensee, Inc. ("LQL") on February 29, 1996. TRW does not oppose grant of the application; however, it does have some observations concerning the alterations in LQL's Globalstar™ system proposal as they relate to LQL's recent comments on TRW's modification of its Odyssey™ system. The changes to the Globalstar™ system indicate that LQL's assertion that the Commission should establish a "per constellation" power flux density ("p.f.d.") limit for code division multiple access ("CDMA") mobile-satellite service ("MSS") systems may have been a defensive effort motivated by the inherent susceptibility of its own system proposal to interference. Although this aspect of the LQL system design does not affect the overall acceptability of its application, neither does it provide a basis for constraining the

operation of Odyssey™ through the sort of unwarranted restriction that LQL has previously proposed.

In its recent Comments concerning TRW's license modification application, LQL acknowledged that the S-band p.f.d. coordination threshold for MSS systems had been relaxed at WRC-95.^{1/} However, at the same time LQL asserted that the Commission should establish an additional "per constellation" p.f.d. limit — as opposed to the "per satellite" values adopted at WRC-95 — specifically for CDMA MSS systems in the 2483.5-2500 MHz band.^{2/}

In response, TRW pointed out that such a step by the Commission would be unwarranted in view of its prior directive to the CDMA MSS licensees to coordinate their operations informally, without formal Commission intervention.^{3/} TRW also noted its belief that these negotiations could be concluded successfully, based on its anticipated compliance with the existing standards.^{4/}

^{1/} LQL itself sought a waiver of the former p.f.d. limits in its original application, anticipating the actions that were in fact taken at WRC-95. See Loral/Qualcomm Partnership, L.P., 10 FCC Rcd 2333, 2335-36 (¶¶ 19-21) (Int'l Bur.1995).

^{2/} See LQL Comments, File No. 33-SAT-AMEND-96, at 6-7 (filed February 23, 1996).

^{3/} See Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to a Mobile Satellite Service in the 1610-1626.5/2483.5-2500 MHz Frequency Bands, 9 FCC Rcd 5936, 5962-63 ("Big LEO R&O").

^{4/} See TRW Consolidated Response, File No. 33-SAT-AMEND-96, at 6 (filed March 7, 1996).

LQL's modification application provides further insight into its desire to impose additional regulatory limitations on other CDMA MSS systems. In its modification application, LQL includes revised satellite parameters which indicate that the average power available for each satellite's communications payload has been reduced by nearly half — to 346 Watts (from 660 Watts in the licensed system).^{5/} The ultimate result of this change is a nearly 75 percent reduction in the power available for S-band service links, as detailed below, and a likely substantial diminution in overall system performance.

Contemporaneously with the filing of LQL's license modification application, Mitsubishi Electric published a paper showing that the high power C-band feeder link amplifiers to be used with the Globalstar™ system are capable of delivering 25 Watts of multicarrier RF output power at a DC power consumption of approximately 120 Watts.^{6/} Because two of these amplifiers will be used by Globalstar™, the Mitsubishi paper implies that a total of 240 Watts will be used by that system for the feeder link transmissions, with the remaining power available for transmitting to handsets or other user terminals. Simple calculations show that this constitutes a 75 percent reduction in

^{5/} See LQL Modification Application at Table 2. In addition, the satellite mass has been increased by approximately ten percent.

^{6/} See Ono, T., T. Ozawa, A. Kamikokura, R. Hayashi, K. Seino, and H. Hirose, "Linearized C-Band SSPA Incorporating Dynamic Bias Operation for Globalstar," 16th International Communications Satellite Systems Conference, February 25-29, 1996, Washington, D.C.

the average power available for S-band service links — *i.e.*, $660 - 240 = 420$ Watts for the licensed system, and $346 - 240 = 106$ Watts for the modified system.

With most of the satellite power servicing the high power amplifiers to transmit from the satellite to feeder link earth stations, there is correspondingly less power available for service links to subscriber handsets.²⁷ This is particularly significant for Globalstar™ because it has always proposed S-band signal strengths that are lower than those of the other 1.6/2.4 GHz systems. As a result, it must either service fewer subscribers at the same power levels or attempt to serve the same number of subscribers with weaker downlink signals — with a consequent increase in susceptibility to interference.

Because serving fewer subscribers would be likely to have a significant impact on LQL's revenue projections for Globalstar™, it is apparent that LQL finds itself desiring extra protection for its weaker signals to avoid this result. This desire explains LQL's change of heart on the question of relaxing the S-band p.f.d. levels, and its more recent proposal to constrain p.f.d. levels in the S-band to a greater extent than is necessary or required under the Radio Regulations. LQL is evidently concerned about potential interference from entirely permissible Odyssey™ operations because the Globalstar™ satellites have now been redesigned to be substantially less robust.

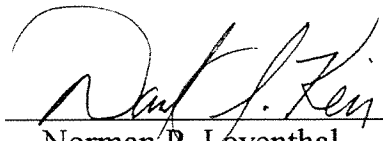
²⁷ A small portion of the communications payload power also goes to the receivers that detect signals in the L-band service uplinks.

While TRW remains committed to reaching a mutually acceptable coordination solution for CDMA MSS,^{8/} it comments here to note that the system design changes LQL is proposing are entirely volitional, and are likely to make the Globalstar™ system substantially less robust. LQL is proceeding down this path with its eyes open, and TRW must not have its ability to optimize the Odyssey™ system unreasonably constrained in order to accommodate possible shortcomings of the new LQL system design. In short, Odyssey™ must not be required to adhere to some unspecified p.f.d. limitation in addition to the ITU coordination limit simply for the purpose of ameliorating inherent service quality problems with the Globalstar™ system.

Respectfully submitted,

TRW INC.

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^{8/} In its application, TRW stated its expectation that it would, in most cases, operate at levels below the coordination thresholds established at WRC-95. See TRW Amendment at 4.

CERTIFICATE OF SERVICE

I, Kaigh K. Johnson, hereby certify that a true and correct copy of the foregoing
"Comments of TRW Inc." was mailed, first-class postage prepaid, this 19th day of April, 1996 to
each of the following:

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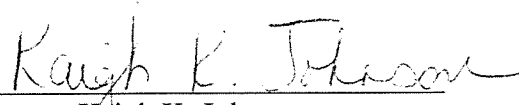
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